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MEMOIRS

OF

AGRICULTURE, &c.

RESOLUTION of the Society for the Encouragement of Arts, &c. June 17, 1767.

"*The Society for the Encouragement of Arts, Manufactures, and Commerce, will occasionally publish in this Work, such Pieces as they shall think proper to lay before the Public.*"

MEMOIRS

OF

AGRICULTURE,

AND OTHER

OECONOMICAL ARTS:

88495

BY

ROBERT DOSSIE, Esq.

VOLUME III.

LONDON,

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TO HIS GRACE

THE

Duke of NORTHUMBERLAND.

MY LORD,

A Multiplicity of circumſtances induces me to take the liberty of dedicating this third volume of the MEMOIRS of AGRICULTURE to you.—The great reſpect, which for perſonal reaſons, I entertain for your Grace, urges me to ſeize this occaſion of giving a teſtimony of it.—The degree in which you are well known to have contributed to the advancement of that kind of knowledge, which affords the ſubjects to thoſe Memoirs, excites me naturally to wiſh them the patronage of your name. And, moreover, your Grace is one of the preſid-

ing members of that Society, to promote the views of which, is a principal intention of the work.

But, my Lord, had not theſe peculiar reaſons ſubſiſted, there is another that might well have diſpoſed me to embrace any opportunity of addreſſing you in a ſimilar mode; it yields the means of expreſſing the gratitude which, in common with all Britiſh Subjects, I owe to your Grace for the benefits accruing from thoſe virtues and talents, that a very elevated rank, and ample eſtate have enabled you to exerciſe in the moſt effectual manner for the public good: for in whatever relation I ſurvey your Conduct, ſuch cauſe of obligation ſtill preſents itſelf.—In a political capacity, I cannot but recollect how meritoriouſly, at the moſt critical juncture, your Grace accepted, and executed the great truſt of Lord Lieutenant of Ireland; where you ſecured the endangered tranquillity to our ſiſter kingdom; and happily cemented the weakening concord between

tween her and ourſelves. Nor does it ſtrike me leſs that uninfluenced by party-ſpirit, or ſelf-intereſt, you have, through the ſeveral changes of miniſtry, moſt loyally ſupported the meaſures of government; except where a conſcientious regard for liberty, or a difference of opinion with reſpect to ſome eſſential point of national intereſt, has led you to diſſent.—In the more confined ſphere of Lord Lieutenant of the counties of Middleſex and Northumberland, your Grace's ſerious regard to the duties of that poſt, exerted with a moſt uncommon expence, very little known to the world, ſtill claims our attention and acknowledgment.—As a Courtier, I ſee your Grace raiſing the ſplendour of the Engliſh Nation, and doing honour to our country, by your noble hoſpitality to all foreigners of diſtinction, diſplayed with unrivalled elegance and magnificence. While in a more private life, you maintain the ſame title to our thanks, for the liberal and extenſive application of your immenſe fortune to charitable Purpoſes and public Uſes; and

for your Grace's ſpirited endeavours to introduce a juſter taſte; and to encourage, by every means, the improvement, not only of the polite Arts, but of all branches of uſeful Knowledge; as alſo, in particular, our Manufactures; an object too much diſregarded by others in high ſtations. But in purſuing truth, I may exceed the bounds in which your Grace will tolerate my revealing it on this ſubject; and in doing juſtice to the other parts of your character, I am apprehenſive of offending againſt your modeſty; to avoid the aggravation of which I muſt refrain from proceeding farther, and conclude with declaring myſelf to be,

My LORD,

Your Grace's obliged and

very humble Servant,

ROBERT DOSSIE.

PREFACE.

VARIOUS cauſes have concurred to delay the publication of this volume of Memoirs: among thoſe that have more immediately operated, two may ſuffice to account for its tardy appearance. The firſt aroſe from a renewed propoſal made in the Society for promoting Arts, to publiſh, under their own direction, the whole account of their tranſactions. Had an intention of that kind been carried into execution, the delay, in regard to this volume, would have become greater, as the Editor ſtill held it a duty to fulfil that part of the plan of his work, which, from a production of the moſt perfect and uſeful ſubjects, tends to do honour to an inſtitution ſo public ſpirited; and ſerves to ſhew that the great advantages which have ariſen from its ſteady purſuits, were reaped from the judicious mode of conducting the proceedings. To anſwer this intention he muſt have waited the appearance of ſome of the annals of that promiſcuous matter which the records offer, in an unavoidably interrupted

terrupted and imperfect ſtate, to collect from them ſuch materials as were moſt intereſting, and would become uſeful, when properly arranged, and accompanied with explanatory and practical obſervations. But it was preſumed that the obſtacle would in time be removed, from the apparent difficulties to which a production ſo general, as that propoſed, was liable: and the diſcuſſion of the argument proved it evidently; for the motion was again overruled, and the former reſolution remained to operate as it had done before; namely to the effect of "giving to the *Memoirs of Agriculture* "*and other Œconomical Arts*, ſuch Papers as a "particular Committee ſhould ſelect to lay be-"fore the Public, and the Editor ſee proper to "inſert in his work."

The ſecond particular cauſe of delay took riſe with the renewed effect of the laſt mentioned reſolution. The Society had beſtowed a very conſiderable ſhare of its funds upon the advancement of every ſubject belonging to the departments that compoſe the Claſs of Polite Arts; thoſe Arts were brought to a ſurpriſing degree of eminence; and no account had been given of the encouragement that raiſed them to that pitch; while the ſucceſſes in other claſſes, thoſe of Agriculture, Manufactures, Mechanics, &c. had been amply diſplayed in the firſt part of this work. An account of the proceedings

ceedings relative to the Polite Arts, might indeed eaſily enough have been given, if a liſt, ſimply relating dates, claſſes, names, and premiums, could have conveyed an idea of the great advantages obtained: it would not have coſt much time or trouble to extract one of that kind from the Society's regiſters: but the exertions and the ſucceſſes were too conſiderable to be treated in ſo curſory a manner: it was eſſential to point out the growth of the arts, to note the ſubjects of the performances that obtained the prizes: and likewiſe, in giving the names of the fortunate candidates, it was equally intereſting to add the profeſſional occupation, and actual place of abode of ſuch as have devoted themſelves to the public exerciſe of the arts. A circumſtantial account of that kind tended, moreover, to anſwer the ultimate purpoſe of the Society; namely, that of the moſt public encouragement of the art and the artiſt. A liſt compoſed ſo as to anſwer thoſe ends, appeared at once an eaſy undertaking; but the very firſt attempt to compile it, proved that the matter ſtood ſurrounded with diſcouraging circumſtances. The ſubjects of enquiry occupied a period of more than twenty years; many of the candidates were ſpread over the extenſive ſpace of the Britiſh Empire, others were gone abroad, and others dead. A purſuit in ſo wide a field, muſt take time, be pregnant with difficulties, and unavoidably retard

retard the publication of the volume: but as it formed ſo important a part of the plan of the work, it was therefore reſolutely undertaken. Thoſe who peruſe the liſt, will judge, whether the ſucceſs of the work be equal to the diligence of the reſearch which it required: they will, it is hoped, conſider, that the changes which naturally have happened, in that extent of time, could not allow every particular to be obtained: but if the number collected, and the information communicated, offer an intereſting view of a ſtate of the arts improved to eminence; and at the ſame time ſhew the exiſtence of a number of able artiſts in the various branches, formed by the inceſſant endeavours of the Society; ſome amends will be made for the late appearance of the volume; and a ſatisfactory return will be reaped by the Editor for the pains taken in compiling the liſt of ſo conſiderable a number of valuable objects.

To give a general notion of the contents of this volume, it muſt be ſaid, that they conſiſt of the moſt intereſting Memorials choſen out of thoſe preſented to the Society, during the ſpace of time the book comprehends. They are moſtly on ſubjects of Agriculture, and offer either new matter, or continuations of former accounts not definitively treated in the preceding volumes. Among the firſt mentioned kind

kind are, the communication of methods for manuring lands, and preparing waſte and barren ground for vegetation: likewiſe the means to make different ſoils proper for bringing forth particular crops: and alſo propoſals for cultivating certain herbs, to ſerve in the farming œconomy, as cheap and ſure winter fodder for cattle. Of the laſt mentioned kind of Memorials, the principal ſubjects relate to the moſt profitable culture of Siberian Barley; of the Bedfordſhire, or Cluſter Potatoe; to the advantageous practice of obtaining crops from wheat ſown in ſpring; and to various other matters promiſing to be uſeful, and appearing to be improvements on the common practices in huſbandry; intermixed with accounts of new conſtructed ploughs and other inſtruments; and communicating alſo a letter on bull-teams recommended for common uſe, and proved from experience to be ſuperior to thoſe of oxen and horſes.

The papers in this book, that belong to the œconomical Arts, offer the valuable deſcription of a new, ſafe, cheap, and expeditious method of making banks and dikes, and repairing breaches in them, to oppoſe the ſea or river waters; practically demonſtrated, and exemplified by delineations of ſome works of that kind, executed upon difficult and dangerous ſpots.—They likewiſe impart another

invention

invention of particular utility in its way; a new mode of conſtructing flat-arches for cielings of rooms, to prevent the communication of fire; contrived in a manner ſo ingenious, as to ſupport themſelves, without much lateral preſſure *.

The ſubjects that appertain to Mechanics, and are treated in this volume, offer, among other accounts, a diſſertation on the conſtruction of wheel-carriages; ſtating their excellence relatively to a determinate proportion in the component parts, and deducing thence the advantage in point of draught; there is alſo a treatiſe in reſearch of the beſt principle for conſtructing ploughs—and farther, an indication of the reception into the Society's repoſitory, of ſome inſtruments and machines for different œconomical purpoſes; as mills, pumps, &c.

In the encouragement related to be given to Fabrics, will be ſeen an account of a promiſing attempt to make bar-iron for heavy work, from pigs of Britiſh ore; and likewiſe for

* Thoſe who wiſh to go farther into the ſubject of conſtructing flat-arches, a knowledge well worth acquiring and practiſing in this metropolis, may reap improvement from an inquiry into the compoſition and qualities of the cements lately diſcloſed; and by reading a pamphlet ſome years ago preſented to the Society, called the *Manner of Securing all Sorts of Buildings from Fire*; a few copies of which are to be had at Mr. *Taylor's*, No. 56, Holborn.

ſmall

ſmall work, a clean, white, tough iron, much wanted.

To mention of the improvements obtained in Manufactures, only what may be called a new branch; it may ſuffice to point out that of chip-hats, made of materials the growth of this country; with the diſcovery, and the actual raiſing of the proper ſort of wood; and alſo the contrivance of a tool to cut the chip exactly and expeditiouſly. It would be tireſome to enter into any detail of the amendments made in the conſtruction of looms, or of thoſe that abridge and perfect the various operations in the art of weaving: they will be found in the liſt of rewards, and the ſummary Table of Contents.

The claſs of Chemiſtry, has produced, but not diſcloſed, the reſpective Arts of making India white copper; and the foreign bronze metal leaf and powder: both from materials the produce of this kingdom. Other uſeful matters, ſpecified in the General Contents, have likewiſe been imparted to the Society, and rewarded, in this claſs.

The branch of Trade with the Colonies, of a nature too tender to be meddled with at this time, bore a promiſing aſpect before the preſent unhappy diſſenſion. Former ſucceſsful attempts had brought forward new propoſals

that,

that, like others, would have turned out to mutual advantage. The detail of ſuch objects would be improper here; and is better reſerved for that happy period when the bleſſings of peace ſhall be again reſtored, and the former amicable intercourſe be renewed, between the unfortunately contending countries.

The ſeveral diſcoveries and communications above mentioned, being the ſubjects, either of memorials, or of premiums offered and obtained without relative deſcriptions, are here ſpoken of promiſcuouſly, from the motive of ſhewing together a number of valuable acquiſitions made, and imparted in this volume.

The matter that ranks under the department of the Polite Arts, offers no memorials, but furniſhes a multitude of performances, either imitating nature and art, or diſplaying genius and fancy. Theſe reſpectively are exhibited here, in a particular arrangement of which ſome account muſt be given.

The order that firſt appeared proper to be obſerved, in compoſing a liſt of thoſe various performances, was in a manner dictated by the earlieſt publication of the Society's advertiſements. They began by the youngeſt years of the candidates, for the ſimpleſt drawings; and went on progreſſively, requiring more exer-

tion of talents, from an increaſe of years; unto an unlimited age for the production of the moſt maſterly compoſitions. This ſhort and eaſy rule that gradually adjuſted ſubjects to years, bid fair to become the ground-work of an intereſting liſt; but was nevertheleſs directly oppoſed by the method in which the matter was recorded in the Society's Regiſters: there it preſented itſelf in the order of time, as the relative proceedings had taken place: and in that ſtate the matter ſtanding widely disjointed as to kind and age, directly contraſted the original rule, and offered no mode of diſpoſition that appeared fit for a general purpoſe; yet as it could partially ſerve, where the objects were few, and not interfering with each other, it was uſed to relate the events of the firſt three years, in that chronological manner. Beyond this ſpace, it could no more be uſed, as the greater variety of unconnected matter brought on confuſion. Several unſucceſsful trials to combine the jarring methods, made it evident that nothing leſs than a total diſmembering of the Regiſters, would anſwer the end of bringing together the parts that had an affinity to each other, in order to ſhew from a proper arrangement, the ſucceſs obtained in every particular branch of ſubjects. This effect was expected to reſult from the following operation: firſt to divide the whole account of tranſactions into ſeparate departments, under general heads, ſuch as drawing,

etching, engraving, painting, &c. then to ſubdivide thoſe under diſtinct titles into ſections, according to the nature of the ſubjects; ſuch, for inſtance, in the extenſive branch of drawing, as the particular deſigns pointed out for the advancement of the art itſelf; or thoſe intended to improve taſte in the patterns of our manufactures and handicrafts. And likewiſe, in the diviſions of engraving and painting, where the diſtinction was eſſential, there a line was to be drawn between the regularity of hiſtorical compoſitions, and the expreſſion of fancy in landſcapes and ſea-pieces. In ſhort, every kind of object was clearly to be preſented in a ſeparate point of view. This mode of diſtributing ſo great a variety of matter, appearing more eligible than any other propoſed, it was adopted; and appearing to be in ſome degree ſyſtematical, it tends to ſhew the ſeries of every ſort of ſubjects approved and rewarded, during the time of their reſpective continuance and encouragement, which forms periods generally compriſed between the years 1758 and 1776, that give the ſcope of matter belonging to this claſs. Should any want of clearneſs ariſe from the circumſcribed ſpace allotted to the liſt in this volume, the alphabetical index will point out ſuch of the diviſions as may be ſought, when the general indication of age, at the head of every page, does not plainly enough lead to it.

The

The public ſpirited, liberal, and rational manner in which the objects of this extenſive and intereſting claſs have been conducted, comes next eſſentially to be made known. An early conſideration of the low eſtate of the arts in this country, and a generous reſolution of raiſing them out of that languor into which they were ſunk, was ſoon followed by well concerted meaſures, to render the degree of ſucceſs that might be obtained immediately applicable to commercial objects. We were far behind other countries as to elegance in patterns for manufactures, fabrics, ornaments of dreſs and furniture: our exports ſuffered from the opinion, that what we made was devoid of taſte and beauty. Such defects called aloud for remedy; and the firſt aim in the amendment of the arts, was therefore directed to thoſe intereſting objects. Scarce was it probable that a new and quite different ſtyle of expreſſion ſhould be obtained from perſons habituated to a ſtiff and unmeaning manner of drawing; but more likely was it thought that unpractiſed youths, endowed with happy talents, might ſtart forth, animated by the incitement of rewards and public commendation, to make efforts to produce the novelty that was called for. In all events the trial tended to forward other views; it would produce the number of young artiſts required to fill the departments that lead to the higher branches

of the arts. Upon that plan the ſociety began to invite boys and girls, mere children as to age, to bring in drawings *of any kind*, to ſhare the premiums offered. The firſt attempts produced, which chanced to be heads, ſmall landſcapes, flowers, figured vaſes, ornamented ſcrolls and brackets, were ſo happily executed, that advertiſements were directly publiſhed requiring *fancy deſigns*, ſuch as might give hints, and become of uſe to manufacturers, callicoe-printers, embroiderers, and upholſterers. Theſe demands produced a number of claims, in which invention was diſcovered, but not what is called taſte, or that diſplay of judgment reſulting from a well regulated imagination. It was thought, however, that perſeverance and culture would remedy the defect. In that perſuaſion the premiums were continued, and opened to more advanced years. At the ſame time rewards were alſo offered for a number of ſubjects; human figures, birds, beaſts, fruit; all connected with deſigns of ornaments for the trades, and equally leading to the higher departments, of which drawing is the baſis. Theſe laſt being attended with uncommon ſucceſs, others more complex were pointed out; and after them came on, ſooner than was expected, the greater encouragement reſerved for compoſitions of landſcapes, and hiſtorical ſubjects. From drawing they were extended to engraving, then to painting, and thence to modelling

modelling and ſtatuary. Other departments were likewiſe intermixed: in proceſs of time, the prizes were ſo ably contended for, and ſo liberally adjudged, that no farther incitement ſeemed requiſite, than that patronage from the public, which the young artiſts then became entitled to, from the open commendations and rewards of the ſociety.

Great as this ſucceſs muſt be deemed, the views of the ſociety were yet but partially anſwered: they were ſtill more extenſive. The ſpirit of emulation to be kept up by the conſtant encouragement of young candidates, was to produce, as has been already hinted, a regular ſucceſſion of artiſts to the various departments of this unbounded claſs. The premiums were on that account farther continued; but formed in a manner ſuitable to the attainment of that final purpoſe, and to ſome incidental circumſtances to be mentioned in the ſequel of this narrative.

The rapid progreſs made in the ſuperior departments of the arts, muſt however not be aſcribed ſolely to the generoſity in offering, and the deſire of obtaining the premiums held forth: they were equally owing to other well concerted meaſures; and in particular to a comparative conteſt happily brought on between the common and a higher rank of candidates:

young nobility, gentlemen and ladies of diſtinction, were invited to contend for honorary rewards, offered in particular to them: gold and ſilver medals, with inſcriptions expreſſive of the degree of merit, were to be the prizes of the beſt performances. It did ſo fortunately happen, that the claims ſent in by thoſe noble perſons, ſurpaſſed even ſanguine expectation: their productions were works of taſte and elegance: the example raiſed a flow of emulation: the young artiſts ſaw how much it was their intereſt to exert themſelves, and vie with contendants ſo much their ſuperiors in rank, as well as merit; to whom, as judges and protectors of the arts, they might ſome day look up for favour and patronage; a ſeparate ſection, following the other ſubjects of drawing in the liſt, bears teſtimony of the proficiency of that diſtinguiſhed ſet of candidates.

The ladies included in that honorary claſs, are not the only part of the fair ſex invited to partake of the Society's offers: there were ſeparate claſſes for girls to contend in a diſplay of fancy deſigns, and compoſitions of flowers and ornaments. Other claſſes alſo were open to both ſexes; and in a large ſcope of rewards, it often happened that the female performances bore the palm from the claims of the youths. Where the claſſes were diſtinct, the accounts in the liſt are ſeparate; but where the offers were

were made jointly to both ſexes, the candidates are recorded promiſcuouſly, ſharing a divided reward.

Another meaſure judiciouſly adopted to make young perſons emulate each other, and contend with junior artiſts, took place as ſoon as the ſpirit of drawing was ſufficiently diſplayed in their works. It was the producing to the public annually all the performances that had obtained premiums in the courſe of the year; and as thoſe exhibitions were not guided by partiality, but really meant to be comparative, the artiſts reſiding here were invited, and agreed to ſend in the compoſitions they were deſirous of producing to public view. This practice, more than any other, operated to keep the minds of the artiſts intent upon ſtudy, and made them ſtrive to excel. The ſpace of a twelvemonth was taken up in preparing the new performance from which ſome additional honour and reputation was to be derived.

Thus far were the arts advanced under the culture and encouragement of the Society, when a new Inſtitution aroſe, and gave an additional ſupport to the ſuperior and ſcientific parts, namely, to painting, ſculpture, and architecture. A prior aſſiſtance, it muſt be known, had contributed in ſome degree, to the great ſucceſs that was obtained: it ac-

crued from an aſſociation of artiſts, who long before held regular meetings in St. Martin's Lane, where they had opened an academy for drawing from living human figures, and at which the candidates for the Society's premiums were admitted under certain regulations, in the year 1759. This company having given repeated inſtances of the riſing powers of the Engliſh genius, became ambitious of a public name and eſtabliſhment: they ſought royal favour, and obtained a charter, which, in 1765, formed them into a regular body, by the name of the *Incorporated Society of Artiſts of Great-Britain.* They did not however remain long united: a diviſion aroſe among them, from a diverſity of opinion, and probably ſome ſeparate intereſt, which made a number to ſecede from the reſt, and they being fortunate enough to meet with royal ſupport and protection, were placed at the head of a new Inſtitution, called the *Royal Academy*, which, in 1768, was eſtabliſhed in Somerſet-Houſe, under the the King's patronage. This new body, above alluded to, which from its plan offered a concurrent aid to the Society, is compoſed of forty reſpectable artiſts, with the title of *Royal Academicians*, governed by a council, annually ſelected from its own members, and formed upon the model of foreign inſtitutions of a ſimilar kind; has a ſchool, a gallery, and profeſſors for the inſtruction of youth

youth in the reſpective departments. Young ſtudents are admitted according to particular rules; and they riſe in time to the ſtate of Aſſociates, a rank into which have been, and are ſtill received, upon proof of abilities, a number of perſons, not exceeding twenty, being profeſſed and able artiſts; and who form the body out of which the vacant ſeats of the Academicians are filled. Subjects are yearly propoſed for honorary rewards: one year they are hiſtorical, or other compoſitions, at the option of the preſident, and Council, and to be executed in oil colours: original deſigns in architecture; and a ſtudy model in ſculpture. A gold medal is adjudged to the performance that has moſt merit in each of thoſe departments. And the next year the claims are directed to be, drawings of academy figures; delineations of celebrated pieces of architecture; and models of human figures; for which a ſilver medal is given to thoſe whoſe productions are deemed the beſt. All the performances are done by ſtudents of different ſtanding, and under the eye of the viſitor for the time being. A greater honour and advantage is ſtill to be reaped by a ſtudent of ſuperior talents, who has become a ſucceſsful candidate: ſuch perſon being thought properly qualified to travel for inſtruction, and to acquire a genuine taſte, from a ſtudy of the antique, and the works of the moſt famous modern maſters, is, once in three years, elected

elected by ballot, and, with the King's approbation, ſent abroad at the expence of a particular fund, called his Majeſty's Bounty. The inſtruction and the rewards are confined to the ſtudents and members of the academy; but once every year, after the example ſet by the Society, they alſo make a public exhibition; and then receive the admiſſible works of every regular artiſt in the kingdom.

Nothing could more fortunately meet the views of the Society in their fulleſt extent, than the purpoſes of that new inſtitution. Their united endeavours have produced a complete and permanent eſtabliſhment to the arts. The more eminent parts directed, rewarded, and openly commended by the Royal Academy, appeared to belong to that body; while the branches regarding fabrics and manufactures, original objects of the plan deviſed for promoting trade and commerce, remained to be ſhaped foſtered, and encouraged by the Society. This diviſion embraced all that was wiſhed to be compaſſed, and ſuited each collective body beſt. In what degree ſucceſs has attended thoſe parts of which the Society has thought fit to promote the improvement, will be ſeen in the liſt, as the ſcientific and the commercial objects reſpectively come forward. But a particular inſtance of the effect which their combined endeavours were capable of producing, muſt

muſt not be left unnoticed here. In the year 1774 an attempt was made to fix an epocha of the eminence at which the art of painting in this kingdom then ſtood. A member of the Society, an artiſt* of diſtinguiſhed ability, made a propoſal to engage ten of the firſt artiſts to produce each in his own manner, and in oil colours, a ſubject remarkable in Engliſh hiſtory; thoſe pieces, made all of one ſize, were intended to decorate the great meeting room, as the property of the Society, in honour of its having been the firſt and meritorious promoter of the arts. The names of the painters were taken from the liſts of the above-mentioned inſtitutions, to prove that no partiality was oppoſed to eſtabliſhed merit. The project ſtood for ſome time in a promiſing light; but by a diviſion of intereſt among the artiſts, and the particular views of individuals, neither that propoſal, to which the Society fully concurred, nor one immediately prior to it, made by the Royal Artiſts to ornament the cathedral of this metropolis, took place. Thus did a well concerted plan, although prudently conducted, prove abortive, by the mere unſteadineſs of human purſuits, when liable to a variety of opinions. The projector was nevertheleſs honoured on the

*VALENTINE GREEN, Eſq; Royal Aſſociate, mezzotinto engraver to the King, and to the Elector Palatine; profeſſor in the Academy at Duſſeldorp, &c.

part

part of the Society, with a token of approbation of his zealous endeavours. The gold medal was preſented to him, with an inſcription expreſſive of the grateful ſenſe entertained of his repeated attempts to promote the objects of their Inſtitution *.

A particular attention, and conſtant practice of leaving no endeavour unacknowledged, and no ſervice unrewarded, when any way conducive to the advancement of uſeful purpoſes, has been diſplayed in a number of inſtances that do honour to the Society, and have hither-

* The propoſal here mentioned has however been productive of a magnificent and very extenſive work, undertaken ſolely by JAMES BARRY, Eſq; R. A. one of thoſe ſelected to contribute his abilities towards the decorating of St. Paul's, and afterwards by the Society to aſſiſt in carrying on the above deſcribed plan. This arduous labour is likely to reflect great honour on the artiſt, as a man of genius, and much claſſical knowledge. He intends diſplaying his talents in embelliſhing the Society's great room, with *a ſeries of hiſtorical repreſentations, illuſtrating the riſe and progreſs of Arts and knowledge among mankind, from the earlieſt period to the preſent times.* There is likewiſe no doubt but the Society will be gratified with an univerſal applauſe of their unwearied endeavours, from this public and ingenious mode of recording the ſucceſſes obtained by the liberality with which they have cheriſhed the arts. The Society and the artiſt are alike indebted to the indefatigable exertions of Mr. GREEN, for bringing forward, and conducting this propoſal to a happy iſſue.

to not been mentioned. Several members having zealouſly lent their aſſiſtance to inveſtigate and forward buſineſs liable to tedious diſcuſſion; or having taken upon them the management of ſome particular matter requiring profeſſional knowledge; and who in the execution thereof had beſtowed time and pains: ſuch perſons, whether preſident, vice-preſidents, chairmen, or other members, have been gratified, not only with public thanks from the preſidial chair, or by letter from the ſecretary; but have alſo been honoured with the gold medal bearing inſcriptions ſuitable to the good offices rendered. One of the firſt given, and moſt eſſential to be here recorded, was that preſented to the inſtitutor, and which bore theſe energetic words: *To Mr.* WILLIAM SHIPLEY, *whoſe public ſpirit gave riſe to this Society.*

It is a matter deſerving of attention, and not out of place here to relate, thatthe Spirit of this generous and beneficent Inſtitution diffuſed itſelf in a few years, by the weſtern, northern, and eaſtern counties, through all England, forming aſſociations as ſimilar to that of the metropolis, as local circumſtances would allow. It alſo ſpread abroad into foreign countries, where the riſing name of the Society, and the intereſting accounts of early progreſs imparted by correſponding members in the principal parts of Europe, gave riſe to ſeveral eſtabliſh-

eſtabliſhments of the ſame kind, that do honour to their founders and conductors, and produce remarkable advantages to the ſurrounding communities. Theſe ſeveral foundations, and ſome of older ſtanding, chiefly promoting ſubjects of rural œconomy, huſbandry, and the relative mechanical Arts (that of Dublin alone extending its views to trade and commerce) have all ſought and kept up an intercourſe with this original body; and many of them, the later companies at leaſt, have thence adopted the plan to which their various ſucceſſes are aſcribed. None of them, however, could attempt, unſupported by ſo liberal a private contribution, to encompaſs a field of objects, extenſive as that which is diſplayed in this work; for it is evident that to the happy production of ſo great a variety of objects, the conſiderable expence beſtowed, has eſſentially operated. The ſums, for inſtance, laid out upon the important branch of Agriculture, including the encouragement given to purpoſes of that denomination in the Britiſh Colonies, form a greater amount than that of any other diviſion of ſubjects; one only excepted, the claſs of Polite Arts, upon which, to cultivate and eſtabliſh the different departments, has been expended one third part of the whole contribution received for the collective maſs of premiums to anſwer the extenſive plan of the original inſtitution. And it may perhaps ſurprize the reader

der to be informed, that the third part of the funds thus applied in money, medals, and pallets, amounts nearly to *nine thouſand pounds*, for the ſpace of time comprehended in the account of rewards now produced.

The liſts of the other claſſes of ſubjects encouraged by the Society, require no farther explanation, than that they are given in continuation of thoſe publiſhed in the firſt volume of this work. Any thing particularly worth notice in them, has been mentioned in the ſummary account of matters moſt intereſting, given in the former part of this preface, in order to bring the objects relative to each other into the moſt collected point of view. Whatever has been rewarded, and is not circumſtantially deſcribed, carries with it the evidence of its utility, to any perſon converſant in that particular matter. And where Bounties have been given to objects only collaterally belonging to the claſs under which they range, and appearing in themſelves but trivial, though often of value to the relative ſubjects; a freſh proof of the Society's generous diſpoſition ariſes from their rewarding every ingenious diſcovery; and ſhews them inclined to give the greateſt ſcope of encouragement to all perſons who employ their talents in the purſuit of purpoſes, that may become in any degree uſeful to the community.

ERRATA.

Page 204. The note mentions two Medals given for laying out a *Botanic Garden in St. Vincent*, while one only was beſtowed upon the Cultivator employed by the Founder: and no token whatever of attention was offered to that perſon, who in concurrence with the Society's views, was at the expence of the whole. See the Account of Premiums for Trade and Colonies.

Page 204. The reference to a note, p. 261, ſhould be to p. 264.

Page 205. Mr. *Strachey's Plantation*, ſaid to be in St. Vincent's, is in Eaſt Florida.

Page 321. The account of two ſorts of *Boercole*, points out the green as the hardieſt; but that being a miſtake, the quality of reſiſting froſt, muſt be aſcribed to the purple, thence deemed moſt fit for cattle: yet for kitchen uſe, the green is more delicate, and in all reſpects preferable.

A few typographical errors, not affecting the ſenſe, will, it is hoped, candidly be overlooked or corrected.

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WHEN every Country in *Europe* is attempting Manufactures, and ſtriving to gain a Superiority in Commerce; when thoſe who uſed to contend for Power are becoming our Rivals in Trade; it muſt be the Deſire of every Well-wiſher to his Country, to excite a Spirit of Emulation, to encourage Ingenuity and reward Induſtry. The readieſt Way perhaps of reforming Habits of Vice, is to remove thoſe of Idleneſs, itſelf the greateſt political Vice.

The ordinary Profits which ſhould attend Invention and Labour, are ſometimes remote, often uncertain, and conſequently to the Multitude inſufficient. To increaſe thoſe Profits, and at the ſame Time the Number of Perſons to reap them, is ſcarce poſſible; the Public Intereſt conſiſts in the many employed Hands, not in the accumulated Wealth of a few.

To add a Spur to Induſtry, to improve Agriculture, increaſe Manufactures, and extend Trade, no Method ſeems ſo well adapted as that of beſtowing Premiums or Rewards, which may excite Men to undertake and accompliſh uſeful Deſigns. Rewards ſkilfully appointed and impartially diſtributed, have at all Times been thought to operate powerfully on the Minds of Men; the Difficulty has rather conſiſted in the Application than in the Effect, rather in ſelecting the propereſt Subjects of Reward, than in finding Perſons who would endeavour to merit them.

It

It is not even ſufficient to fix upon the Subject; for unleſs Labour is aſſiſted by Art, unleſs the Knowledge of the Learned is communicated to direct the Hand of the Induſtrious, the Labourer may waſte his Time and Strength in vain, and Study may degenerate into Amuſement.

Such Reflections induced ſome of the Nobility and Gentry of this Kingdom to attempt forming a Society for the Encouragement of Arts, Manufactures, and Commerce. It ſoon appeared that a Communication of Thought was only wanting to give it Being, and it is now diſcovered that Information of its Exiſtence is only neceſſary to render it extenſive and beneficial.

Within the Intention of the Society all the Dominions of the Crown of *Great Britain* are included: but *Ireland* having a Society of the like Nature ſupported by the Parliament of that Kingdom; and *Scotland* having a voluntary Society for the ſame Ends; all Rewards given by this Society are in general, unleſs the contrary be expreſſed in the Advertiſements, applicable to *England*, *Wales*, *Berwick*, and the Colonies only.

The Methods of proceeding to carry the Intentions of the Society into Execution, are regulated by Agreement, and printed together in a Book of *Rules and Orders*.

MEMOIRS

OF

AGRICULTURE,

AND OTHER

OECONOMICAL ARTS.

ARTICLE I.

Accounts of the Culture, Produce, and Qualities of the Species of the Grain, called SYBERIAN BARLEY, *communicated, by ſeveral Gentlemen, to the* Society for the Encouragement of Arts, Manufactures, and Commerce; *and inſerted at their Requeſt.*

To *Robert Doſſie*, Eſq.

SIR,

THE Society for the Encouragement of Arts, Manufactures, and Commerce, have directed me to deliver to you the ſeveral accounts of Syberian

Barley*, communicated by Mr. *Widdens*, Mr. *Halliday*, Mr. *Reynolds*, Mr. *Remey*, Mr. *Hay*, Mr. *Webſter*, Mr. *Young*, Mr. Mr.

* The late Mr. Wych, who was, for ſeveral years, chairman of the Committee of Agriculture, and, with the warmeſt zeal for the improvement of uſeful arts, applied part of an ample fortune to that end, obtained, and produced to the Society, ſeveral foreign or uncommon ſpecies of grain, and ſeeds of other plants, which might be ſuppoſed capable of being cultivated here with advantage, when their properties ſhould, through due experiments, be better known.—Amongſt the reſt was a kind of corn to which, at that time, was given the name of EGYPTIAN BARLEY; or by others, with more botanical accuracy, EGYPTIAN WHEAT; as it is, in reality a ſpecies of wheat, according to the true characteriſtic of that grain. It has, however, ſince been generally known by the name of SYBERIAN BARLEY: which, with relation to its culture, and the uſes it is naturally adapted to, may, in a commercial view, be deemed a better denomination for it than *wheat*.

The quantity of this grain, which Mr. Wych brought to the Society was ſmall: and it did not ſtrike moſt of thoſe, who examined it, with any ſtrong prepoſſeſſions in its favour. — It was, nevertheleſs, divided amongſt ſuch members, as were willing to have trials made of it; which was all the notice it was then thought to merit: and the Society were not led, by any further information, to renew their attention to it, till the year 1771. At that time, Mr. Saluſbury Brereton, one of the vice-preſidents, laid before them, the accounts given by Mr. Halliday, and Mr. Widdens, of their cultivation of, and obſervations on this grain: a ſmall quantity of which, part of that firſt produced to the Society, they had received, in 1767, from Mr. Brereton; and had increaſed, ſo as to ſow many acres with it themſelves, and diſperſe it into many parts of England, and ſome of Scotland and Ireland: finding it not to degenerate in our climate, but to be very ſuitable to it; and to be preferable, on the whole, to any ſpring-corn at preſent cultivated in our

Anderdon, General *Elliot*, Mr. *Johns*, and a Gentleman in Shropſhire, who ſigns himſelf *A Shepherd*, in order to their being inſerted in the Memoirs of Agriculture, if you think proper.

I am, Sir,

Your very humble ſervant

SAMUEL MORE, ſec.

To *Owen Saluſbury Brereton*, Eſq.

ON the 25th of May, 1767, Mr. Widdens gave me the ſmall quantity of ſeed, of the grain now called SYBERIAN BARLEY, you had ſent him; which, you know, did not exceed a moderate wine-glaſs full: but he knew nothing of its nature, nor of the climate, where it grew:—This uncertainty, and the ſeaſon's being far advanced, created fear of a want of ſun, to bring it to

our country.—The Society was induced, from this information, to procure a great number of buſhels of it, in order to its being diſtributed among ſuch of the members, as would undertake to cultivate it, and give an account of the reſult; and this meaſure was, alſo, again repeated the ſucceeding year. It was, in conſequence of this diſtribution of it for ſeed, that the other accounts of the culture, and nature of this grain, were moſtly given to the Society: and they contain, it may be preſumed, taking the whole together, a ſufficient diſplay of facts, to enable the public to form a juſt judgment of this kind of corn, with relation to the beſt mode of culture; its qualities; and the comparative advantages, either local or general, of ſubſtituting it for the common kinds of wheat, or barley.

maturity; and induced me to divide the ſeed with a neighbour, whoſe garden, I thought, warmer than mine; and who had the advantage of glaſſes, or fire, to bring it forward. *This ill ſucceſs ſhewed, however, that this grain doth not require a climate warmer than our own.*

On the 26th of May, I ſowed my half of the ſeed, in a drill, on a ſouth border of the garden, each grain four inches apart; where it was carefully weeded, hoed, and ſometimes watered: and, as it was inclined to be rank, I had it, alſo, ſupported with lines and ſtakes. Some few ears were ripe by the laſt of Auguſt; which I gathered by hand (continuing this practice, morning and evening, till the 8th or 10th of October), and hung them up in a linen bag.

In April, 1768, I rubbed the grain out by hand; and was pleaſed to find my produce almoſt a quart. In the firſt week in May, it was all ſown in drills, as before, on the ſouth border of the garden, and on part of a laſt year's potatoe-butt; where it was kept clean, and hoed.—That, which grew in the garden, was gathered as before; and, on the 28th of Auguſt, that on the butt was reaped in the common way; and the whole was then hung up in bags until the beginning of April, 1769, when it was threſhed out: and it produced about a buſhel of thirty-five quarts.—On the 19th

and

and 20th, this buſhel was ſown by hand, in drills, in a field well prepared: and it covered about one half of a ſtatute acre — In the beginning of June, it was carefully hand-hoed; and was reaped on the 14th and 15th of Auguſt. This crop produced thirty-five buſhels and an half of clean corn.

Having now obtained a quantity of this grain, from which I could afford to make ſome trials of the utility of it, in the grand articles of *bread and beer*, I had two buſhels malted; and another two, weighing one hundred and thirty-two pounds, ground, at a country mill. The latter yielded eighty pounds of fine flour, nearly equal to London ſeconds; forty pounds of a worſe ſort; and about eleven pounds of bran, ſuperior, nevertheleſs, to wheaten-bran. The firſt ſort of the flour made *excellent ſweet bread*, ſufficiently fair and light; yet ſo retentive of moiſture, as to gain double the increaſe of wheaten-flour equally fine, kneaded and baked at the ſame time; and to continue *as freſh when twelve days old*, as the wheaten *at four days*.

The two buſhels, that were malted, gained ſix quarts in meaſure: and, in the latter end of January, were brewed into a half barrel of ſmall-beer, and another of ale. The beer was uſed at a month old; and was good: the ale was tapped when four months

old; and proved excellent in *flavour, colour, and body.*

Theſe experiments eſtabliſhed, with me, the higheſt idea of the ſuperiority of this barley over every other ſpring-corn; and convinced me, that nothing was wanting to make it every where eſteemed, but to make it every where known. The public, I was ſure, would be benefited by its culture: and the reſult yields me unſpeakable pleaſure. For though eighteen buſhels of the crop of 1769 was, with the aſſiſtance of ſome public ſpirited gentlemen of my acquaintance, diſtributed into twelve different counties in England, two or three in Wales, ſix or ſeven in Ireland, and two or three in Scotland; yet I have had many application from diſtant parts for a freſh ſupply out of laſt year's crop.

Laſt year's experience adds, alſo, to my ſatisfaction, as it ſhows, that this barley will excel all others as much in poor lands, as in rich.—For four of ten buſhels, ſown in the common broad-caſt way, were upon Warbruts Moor; whoſe poverty of ſoil, I believe, you are no ſtranger to; yet its produce was fifteen for one. The other ſix buſhels were on the Breek, and yielded twenty for one.

You are at liberty, ſir, to communicate any part of this narrative to the laudable Society, of which you are a member. I aſſure

aſſure myſelf, they will eſteem the cultivation of this barley, an object worthy their attention and encouragement: and, ſhould they think proper to beſtow any honorable mark of their approbation of my poor endeavours, it will be highly flattering to

Sir,

Your moſt obedient ſervant,

Annfield,
1ſt Feb. 1771.

W. HALLIDAY.

To Mr. *Samuel More*, Secretary to the Society for the Encouragement of Arts, Manufactures, and Commerce.

Annfield, near Liverpool, 19th March, 1771.

SIR,

IN obedience to the Society's commands delivered me by your favour of the 13th, I have ſent, by this day's waggon, all the Syberian Barley I could ſpare. There are four ſacks, containing eleven buſhels, twenty-five quarts of the beſt or two-rowed ſort; and one bag with two buſhels of the *ſix-rowed* kind: which, though lighter by three pounds in the buſhel, may be thought well worth cultivation: as it yields flour equally good as the other, and with as little bran. Its ſtraw is ſtronger:

and its increaſe, with me, has been about one fourth greater. Theſe two ſorts were mixed in my original ſeed; but have ſince been kept ſeparate.

The demand among my country neighbours for bread, and ſeed, has been greater, than I could ſupply. At five ſhillings and ſix pence per buſhel, it was the cheapeſt bread-corn they could buy: as it dreſſes into hearty good flour, with only one or two pounds of bran taken out.

The ſix-rowed barley ought to be ſown a fortnight earlier than the two-rowed—Say in the firſt week of April.

I beg the favour of you to let me know, how my care and management of this excellent grain has been approved of by the Society. Happy, in the mean time, in the ſucceſs of my endeavours to extend the knowledge and culture of it, but particularly ſo, in its becoming an object of the Society's attention. I flatter myſelf, it will in time be univerſally cultivated, and as univerſally eſteemed, as ſuperior in its nature and uſes to every other ſpring-corn.

I am, Sir,

Your very humble ſervant,

W. HALLIDAY.

The

The following account of the Syberian Barley was tranſmitted to me, from Thomas Widdens, eſq. of Liverpool, who received the ſmall parcel of it from me, in 1767.

O. SALUSBURY BRERETON.

To *Owen Saluſbury Brereton*, Eſq.

SIR,

I can now, with pleaſure, give you an account of the Syberian Barley I had from your Society, through your hands, in the year 1767. The quantity was about half a wine-glaſs full.—I gave it to my friend Mr. William Halliday, to be ſown under my direction; which was accordingly done, though late in May. When I arrived, I ſowed it, on a border, in his garden, the 19th of May, about two feet from the wall: and it produced a quart. In the year 1768, we ſowed it again, the 10th of April, in an open field, in the drill way; and it produced thirty-ſix quarts. In the beginning of May, 1769, it was ſown, in the drill way, in an open field; and produced thirty-five buſhels: and, this year, we diſtributed it in eleven different counties in England, beſides Scotland, and Ireland, with the

the title of Halliday Barley. In the year 1770, it was ſown the broad-caſt way on three ſorts of land (ſay), clay, ſand, and a mixture of both; and I do aver, its produce to be more than any barley about us. As it yielded, upon an average, nearly twenty-five buſhels for one. It will do on any ſort of land, with the ſame culture as our common barley; and with this advantage, that the land need not to be ſown with above one half of the ſeed as in the caſe of the common barley: and its weight per buſhel will be fifty-eight pounds. I cannot ſay, the grain is in the leaſt diminiſhed in this climate. It makes excellent bread; and a much better malt (having more ſpirit in it) than our barley; and it bids fair to be the moſt uſeful grain in the kingdom for the ſtill, and bread for the common ſort of people: as it has leſs bran than uſual. I think, it will give as good a crop on clay-land as any.—It has another quality, that is, it will be fit to cut ſixteen or twenty days ſooner than our barley, ſown on the ſame day.—I hope to give you ſome of the ale this ſummer, when I have the pleaſure of ſeeing you here: or, ſhould any of your members have a deſire of taſting it, I will ſend you a fine bottle this ſummer. If any of them want any further information, I ſhall take a particular pleaſure in communicating

municating it: or, if at any time, there ſhould be any ſeeds, or corn of any kind, which you would wiſh to have undergo a fair trial, I ſhall think myſelf highly honoured with your commands.

I am, Sir,

Your very humble ſervant,

THOMAS WIDDENS.

To Mr. *Samuel More*, Secretary to the Society for the Encouragement of Arts, Manufactures, and Commerce.

WORTHY SIR,

IN anſwer to your favour, concerning the Syberian Barley, this is the ſubſtance relating thereto.

The three pounds, that came from you and Mr. Baily laſt ſpring, I divided into three equal parts, for three ſowings, on three different ſoils: which was performed in the manner following, viz.

March the 13th, I ſowed one pound on haſel-mould land, in ten-inch drills, by dropping in the ſeed three inches apart.

April the 10th, I ſowed one pound on a gentle rich loam, in the ſame manner as above.

May the 8th, I ſowed one pound on ſtrong brick-earth land, in like manner.

Pro-

	lb.
Product of the firſt ſown was	67
Of the ſecond -	62
Of the laſt -	55

The whole growth being 184 pounds.

This quantity, by admeaſurement, was found to be three buſhels and one gallon true ſtatute meaſure: a noble crop ſurely, from three pounds of ſeed; being no leſs than forty-fold increaſe on a common average.

But by another project, I am going to relate, ſomewhat more remarkable will appear, relating to this grain.

Mr. Young, of North Mims, ſent me one ounce of this naked barley, very large grain, of a fine amber colour, almoſt tranſparent; which was ſown promiſcuouſly on a bit of my kitchen-garden ground, March the 13th, after a foreign wheat crop, the preceding year; but it proved much too thick to produce any tolerable crop. Seeing this, I had the whole tranſplanted out, in and near the ſame place; diſtance twelve inches by ſix, on the 21ſt of May, after a fine rain: and it proſpered ſo well, that the product ſaved was no leſs than ninety-ſix ounces, or ſix pounds, beſides what was eat by the ſparrows: which being conſiderable, may render it juſt to rate the increaſe at one hundred-fold at leaſt. From theſe experiments, it ſeems beſt to ſow this

this corn early, being a hardy grain, which merits our higheſt eſteem truly: and more particularly as it will proſper well on ſtrong ſoils, where our common barley will not. As a proof of this, I ſowed both kinds, ſide by ſide, for trials: and the difference was amazingly great on the three ſoils, but much more ſo on the brick-earth land. Here this foreign grain out-did ours in crop ſo much, that if truly ſet forth would obtain no credit. But thoſe who ſaw the growths, will aver the fact. So here, I reſt it; and I hope this account will be ſatisfactory.

I am, Sir, with all due reſpect,

Your very humble ſervant,

Adiſham,
21ſt Dec. 1771.

J. REYNOLDS.

To Mr. *Samuel More*, Secretary to the Society for the Encouragement of Arts, Manufactures, and Commerce.

SIR,

I will beg the favour of you, to lay before the gentlemen of the Society for the Encouragement of Arts, &c. the following experiments and obſervations, made this year

year by me, on my farm in Ormeſby, near Yarmouth in Norfolk.

Experiments and Obſervations on Syberian Barley.

ON the 9th of April laſt, I ſet half a peck of Syberian Barley, ſent me by the Society. It was dropt, as peaſe are uſually ſet.

On the ſame day, I ſet, in the ſame manner, a like quantity of my own barley, in the ſame incloſure, next the former.

I found the Syberian Barley ripe, fourteen days ſooner than the Norfolk barley.

The produce of the Syberian was thirty times the ſeed.

The produce of the Norfolk barley, was only twenty-ſix times the ſeed, viz.

The Syberian produced fifteen pecks, the Norfolk thirteen pecks.

On the 10th of April, I ſet one quart of ſix-rowed Syberian Barley; which I, alſo, received from the Society.

On the ſame day, I ſet an equal quantity of Norfolk.

The Syberian, with ſix rows, produced about the ſame quantity with the Norfolk, viz. twenty-five quarts each.

A merchant gave a peck of the firſt ſort of Syberian Barley, which he received from Liverpool.

This

This peck I, alſo, ſet on the 2d and 3d days of May, in the ſame incloſure with the former, and it produced near thirty pecks.

I alſo ſet a peck of my own barley two days after: and this produced about twenty-ſix pecks.

The Syberian was fit to be cut fourteen days ſooner than the Norfolk barley.

I am, Sir,

Your moſt obedient ſervant,

December 10, 1771.

JOHN RAMEY.

P. S. The ſeed was all ſown in the ſame incloſure, on land of a good mixt ſoil, rather light, worth, per annum, about fifteen ſhillings per acre: being land intended for barley after turneps, and in good condition.—The remainder of the incloſure (except a ſmall portion of it ſown with bled de mars, or ſpring-wheat) was ſown with Norfolk barley, about three buſhels to an acre, and produced about eight combs per acre.

DEAR SIR,

I received from you half a buſhel of Syberian Barley, weighing twenty-nine pounds and a half. At your deſire, I gave three pounds of it to Mr. Alexander Gordon, there remained twenty-ſix pounds and a half. The 4th of May, I ſowed nine pounds twelve ounces, in narrow drills, about a foot diſtance, in a north expoſure, in light ſandy ſoil, with a ſmall mixture of red earth in it. The ground had been highly dreſſed, limed, dunged, and cleanſed with a crop of turneps the year before. I ſowed a little pigeons-dung in the bottom of the drills, along with barley. The field was laid down with graſs-ſeeds; and, as it was thoroughly clean, the drills required no hoeing; which otherwiſe I could not have given, on account of the land's being ſown with the graſs-ſeeds. The 9th of the ſame month, I ſowed, in the end of another field, in the broad-caſt way, ſixteen pounds twelve ounces, being the remainder of the ſaid grain. This field had, alſo, been richly limed and dunged the year before; and was laid down, when the barley was ſown, with graſs-ſeeds. For we always ſow them with our barley in this country: and I wanted to ſee if this kind would agree with the ſame culture as our barley;

barley; which only could make it of utility. The ſoil of this field is a ſtrong rich red clay, with a ſmall mixture of loam. The 2d of September, I cut down the crop of that grain which was ſown in drills: and the 10th of the ſame month, I cut down that which was ſown in the broad-caſt way. This ſeaſon was extremely bad, and late for all our crops, particularly for barley, notwithſtanding the wet weather. I obtained, after carefully winnowing and cleaning the ſaid barley, thirty-three ſtone Engliſh weight: which, I believe, is near to twenty returns. Had the ſeaſon been good, I ſhould at leaſt have expected ten or fifteen returns more. I obſerved, contrary to my expectation, that, which was ſown in the broad-caſt way, was the beſt crop. I imputed this to the exceſſive dry weather, in the end of June and July, when we were for four weeks without a drop of rain, with hot dry weather, and ſtrong gales of wind: and this was the critical ſeaſon of plants ſtocking and putting forth their ſhoots. That, which was ſown in the light ſandy ſoil, ſuffered moſt by this weather. I think it an exceeding fine ſpecies of grain: and I hope it will anſwer extremely well in this climate. It has one quality that makes it well adapted to it: which is, that it will not ſhake with the wind, even, I think, with any, though

the common barley often ſuffers much from this cauſe. The Syberian Barley ripens about a fortnight, or three weeks, ſooner than any of our ſpring-crops. I hope to be able to ſow about an acre of ground with it, the enſuing ſeaſon; and to give you a better account of it.

I am,

Your moſt obedient ſervant,

Eggie*,
1ſt Dec. 1771.

R. HAY.

P. S. The weather in harveſt was ſo uncertain: and we were ſo much hurried, that we did not get time to keep the crops ſeparate, in order to know what each produced. I have ſown a little of this barley in autumn, to ſee how it will anſwer in that way.

Extract of another letter from Mr. *Hay*, on Syberian Barley, dated Eggie, January 11th, 1773.

I have got ſeventy pounds of the Syberian Barley, ground into flour, which ap-

* Eggie is ſituated ſix miles north of Aberdeen, cloſe by the ſea-ſide.

pears

pears extremely well. I have diſtributed the loaves: and I hope to introduce it into general uſe in this country, both for bread and malt.

Mr. *Webſter's* account of his raiſing Syberian Barley, at Deen, in Northamptonſhire; preſented to the Society of Arts, &c.

Feb. 25th, 1772.

HIS grace the duke of Montagu, in the ſpring of the year 1767, gave Mr. Webſter about three hundred and fifty grains of this barley (then called Egyptian Barley), which his grace had received from ſome member of the Society. In the two following years, viz. 1767 and 1768, Mr. Webſter had increaſed them to the quantity of one peck, or two gallons. The 5th of May, 1769, this quantity was drilled, by hand, upon ſome ſtrong cold clay-land, after a crop of oats, without any fallow: but the land was not in very bad condition, nor of a very bad quality, but of a middling ſort. This produced ſeven pecks, although a conſiderable quantity of the ſeed could not grow: owing to a dry ſeaſon, for about three weeks after the ſowing; and the land's not being well pulverized.—On the 30th of April, 1770, theſe ſeven pecks were ſown by a drill-plough in the ſame

field, upon juſt ſeven roods of land, in rows of ten inches diſtance: which was planting it very thin. The land had a crop of wheat upon it the year before; but was winter-plowed; and ſtirred twice more by the plough, and harrowed well in the ſpring, before the barley was ſown. There was, alſo, about ten quarters of pigeon-dung ſpread upon the ſeven roods of land; ſo that it might be accounted to be in tolerable good condition; but not equal to land that had been well fallowed, and plentifully manured. Unfortunately, the wire-worm, a very deſtructive inſect, took this crop, and deſtroyed at leaſt one third part of the plants; notwithſtanding which, it gathered and increaſed ſo exceedingly from the roots which were left alive, that it produced ſeven quarters, wanting one buſhel, and there would have been a good deal more, had it not been injured by the worm. This barley, though ſown on the 30th of April, was ripe ſooner by a fortnight than the earlieſt ſown common barley, any where in the neighbourhood, that was raiſed upon land any thing near the temper and quality of this.—On the 26th of April, 1771, three acres of land, ſomething warmer and better in nature than the former, were ſown broad-caſt with this barley; allowing about two buſhels and three pecks of ſeed to the acre. This land was, alſo, a wheat ſtubble;

ble; but was winter-plowed, and had a ſmall dreſſing of dung laid upon it. However, when it was to be plowed for ſowing (though it appeared to be mellow on the top), it was found to be ſo tough, and waxy underneath, from the preceding very wet weather, that it would not admit of harrowing in the ſeed. It was, therefore, determined to ſow it under furrow, as is generally done by wheat in autumn: that is; to ſow the ſeed firſt, and turn it in with the plough. By this means, however, it is certain, a conſiderable quantity of the ſeed was buried ſo deep, that it never made its appearance above the ground. A good deal of pains was taken to break the tough furrows and clods, when they became hard, to give the grain all the advantage poſſible that way, or very little crop could have reaſonably been expected.—The land was, alſo, kept clean from weeds; and the grain flouriſhed beyond any thing that could have been hoped. It became, indeed, a tolerable good crop, fully equal to that of ſome common barley ſown, alſo, in the ſame field, and which had been treated in every reſpect in the ſame manner with this, except that the common barley had the advantage of being ſown near a month ſooner than the other. In ſhort, it produced four quarters within a buſhel per acre of exceeding fine grain, that weighed ſixty-ſix

pounds the buſhel neat; a weight ſuperior to a great deal of wheat, and what no common barley ever came near to by many pounds. It ripened, as before, about a fortnight ſooner than the common barley.

It will appear plainly to every one who reads the above, that Mr. Webſter has purpoſely avoided ſowing this barley on the beſt ſort of land, or upon rich fallow. Had he done ſo, there can be no doubt, but that the increaſe would have been much greater —But the deſign was to ſatisfy himſelf, whether this grain was of a hardy nature, and would admit of ſuch cultivation and treatment, as that he might honeſtly recommend it to the farmers, to raiſe it in the common way of their management. He has ſufficiently ſatisfied himſelf of its hardineſs; and believes, it may be raiſed upon all ſuch ſorts of land as are proper for the common barley; and it will yield equal crops with that; and conſequently that the cultivation of it will be both for the farmers emolument, and the good of the public. As it is a much more valuable grain than the common barley, even from its ſuperior weight: but it has many things to recommend it beſides that.

This grain is not only heavier than the common barley, as obſerved above; but is, alſo, of a much better quality. For, when ground, and made into bread, it is not only much

much whiter, but much better flavoured than the common barley-bread; and, when it is mixed with an equal quantity of wheat, makes as good family-bread as any one (not whimſically dainty) would deſire to eat—Beſides theſe, there is another very great advantage in this grain over the other, when ground for the purpoſe of making bread. For, as the ſkin or bark of this grain all peels off in the threſhing, the flour, when it comes to be dreſſed through a ſieve or bolting-cloth, yields no more than three pounds of bran to the buſhel; whereas the common barley hath eight or nine pounds. This, alſo, makes a very great difference in the values of the two grains.—Mr. Webſter has not made any of this barley into malt; but has heard of its being done, and cannot doubt of its being vaſtly preferable to common barley in that way. He thinks, nevertheleſs, it may be moſt advantageous to the public to uſe it for bread: as the common barley will do very well for malting: at leaſt this may hold good when wheat is at a high price.—What, alſo, it is hoped, may be a recommendation for the raiſing of this grain to ſome farmers, is, that where turneps are ſown, the farmers are generally obliged to eat them off ſooner in the ſpring than they would wiſh to do, or is for the advantage of the cattle, on account of ſowing the ground in proper time with com-

mon barley, for fear they ſhould miſs of a crop, were they to defer it till May-day: which indeed would be moſt probably the caſe. But this grain does not require to be ſown ſooner than May-day. There can even be no doubt, but that it would ripen properly, were it to be ſown in the middle of May. This, therefore, will give an opportunity of often preſerving ſome turneps, to be eaten until the beginning, or middle of May, when keeping is generally ſcarce. —It will anſwer the ſame purpoſe, alſo, with regard to ſome other eſculent plants. It is, alſo, more than probable, that, if land well prepared for fallowing and manuring, as is uſual for a crop of common barley, was to be ſown with this grain four, five, or ſix weeks before May-day, as the ſeaſon would admit, it might ripen ſo early in the ſummer, as to give leave when the crop was off the land, to plow up the ſtubble, and raiſe a good crop of turneps, which might be of great advantage to the farmer.—And, it is hoped, ſome other perſons, who have good turnep-land under their management, will, as ſoon as they can, make the experiment. Mr. Webſter will make the beſt trial he can this year; but he has no land, that is very fit for the purpoſe.—This barley hath, alſo, this good property, which ought to be a recommendation to it, that it ſeems to be

more

more diſpoſed to tiller, that is, to throw out a great number of ſhoots and ſtems from the root, than any other grain Mr. Webſter is acquainted with. This will not only be of great conſequence in caſe of a crop's being hurt by the worm, &c. as mentioned before; but there may, alſo, be a conſiderable ſaving made in the article of ſeed. For it certainly cannot be neceſſary to ſow this grain ſo thick as the common barley: as its ſo much greater diſpoſition to increaſe from the root than the other, will make up for a pretty large deficiency of ſeed: perhaps a buſhel per acre.—In caſe alſo, of a wet and unkind ſpring, to prevent the common barley being got into the ground in a proper manner, in March, and the beginning of April, the ſeaſon for ſowing that grain, which does not unfrequently happen, and is always followed by a ſcanty crop, this misfortune may, in a great meaſure at leaſt, be healed by propagating this grain, which will admit of being ſown a full month, or more, later than the other; and will, notwithſtanding, ripen at leaſt as ſoon as that.

Upon the whole, as it cannot be doubted, but this grain will anſwer every purpoſe that the common barley will, and even far exceed it; and that it may be as eaſily raiſed, and will produce as good crops, beſides many other advantages attending it; there,

there, alſo, cannot be the leaſt reaſon to apprehend, but that it will prove a valuable acquiſition in huſbandry, and deſerve to have a proper attention paid to its propagation.

To Mr. *Samuel More*, Secretary to the Society for the Encouragement of Arts, Manufactures, and Commerce.

SIR,

I ſee, by the laſt committee letter, that the Syberian Barley is under conſideration at preſent. I ſuppoſe the letters are from the gentlemen, to whom the Society diſtributed portions of it; I herein minute the reſult of my trials, which you will pleaſe to lay before the Society; as I cannot attend. In March, 1770, manured a piece of ground, the ſoil a wet, poor, ſpungy gravel, but hollow drained, with thirty-five cubic yards of farm-yard dung, ſowed turneps, which were drawn.—In March, 1771, plowed a land ſeventy-four yards long, by eleven feet broad, being the ſeventeenth part of an acre; and harrowed Syberian Barley on one half, and the common barley on the other. Auguſt 23d, mowed them. The product,

Com-

	Pecks.	Quarts.		Q.	B.	P.	G.	Q.
Common	2¾	1	Common, per acre	3	0	1	0	2
Syberian	2¼	0	Syberian	2	3	0	0	1
Superiority	½	1		0	5	1	0	0

Weighed a peck of each.

	lb.
Syberian	14
Common	12
Superiority	2, or per buſhel 8.

Weight per acre Common	1164
Syberian - -	1064
Superiority	100

The ſtraw, through neglect, not weighed; but to appearance, the common was in quantity as two to one. The ſeed of this experiment was ſome raiſed by myſelf: that which I received from the Society as under. —In March, plowed a rood of land after cabbages; harrowed in the flat Syberian, on ſixteen perches, and the furrowed on the other four perches. The ſmall quantity of ſeed allowed the weeds to riſe; but hand-weeded it, Auguſt 22d. Mowed, Sept. 2d threſhed: the four-rowed, produced three pecks, three quarts: weighed fourteen pounds a peck. This per acre is four quarters, one buſhel, three pecks. The other yielded three buſhels and three quarters of a peck; or per acre, three quarters, ſeven buſhels, and a half peck. It threſhed

ſo

ſo very badly, that the men aſſerted two ſhillings and ſix pence a quarter, to be the loweſt price they would do much of it at. Common barley one ſhilling and two pence. Adjoining this rood, ſowed two others with ſpring-wheat I received from the Society; one on fallow and dung; the other divided into ſmall trials, to diſcover the efficacy of various top-dreſſings. The former yielded ſix buſhels, or per acre three quarters. I ſent a ſample to Hertford market, and was offered five ſhillings and ſix pence per buſhel for it, while good common wheat ſold at ſix ſhillings and nine pence.—The cabbages being dunged, I conſider as a preparation equal to the fallow. The two ſorts of grain may, therefore, be compared:

	£.	s.	d.
3 quarters ſpring-wheat -	6	12	0
3 qrs. 7 b. 3 p. barley, at 3s. 6d.	5	3	0
Spring-wheat, the moſt advantageous by	1	9	0

I do not reckon plowings, rent, &c. as I am of opinion, the wheat would have been as good after cabbages, as after fallow. This, however, only opinion. Reſpecting the compoſition for marking ſheep, I uſed it on thirty wethers, exactly by the directions. The ſtuff would not melt; it only burnt; but did tolerably by adding ſome water. It made a clear and deep black mark, ſo that I thought it would fully

fully anſwer: but it wore out in two months, ſo that I was forced to have recourſe to pitch. If this haſty ſketch ſhould not prove ſufficiently clear for the Society's information, I ſhall very readily add any circumſtances, that might be thought eſſential.

I am, dear Sir,

Your very humble ſervant,

Bradmore Farm,
Jan. 12, 1772.

A. YOUNG.

SIR,

I, laſt ſpring, received the favour of a handful of Syberian Barley from you, and afterwards ſeveral larger ſupplies of that corn, and ſpring-wheat. The one was ſent me by Mr. Bayley, and the other I had immediately from one of the worthy members, Mr. Combe: but I imagine, the whole came originally from the Society. I conſider myſelf, therefore, bound to inform the Society of their propagation; and conceive the accounts, taken from my regiſter of them, will be moſt properly conveyed to them through your means.—

I ſhall begin with your preſent of Syberian barley.

Ex-

Experiment No. 1. *Syberian Barley.*

To this, though the leaſt quantity of corn, I allotted the moſt ground; not thinking I ſhould obtain more of it; and planted it the 11th of April, ſix inches aſunder, in ſingle rows, on four-feet ridges. But my account of it will be ſhort: for though the blades came up, not a plant produced perfect corn. This I impute to the ſeed's having been kept too warm; or otherwiſe injured. Grubs, indeed, were in the ground: but I ſhould ſcarce think them capable of ſo total a deſtruction.—With the preſent from Mr. Combe, I was more ſucceſsful.

Experiment No. 2. *Syberian Barley.*

April 24, I drilled a double row, one foot aſunder, on a ridge of five feet, with one pint and a half of ſeed. It was the twentieth part of an acre, or eight perches. The ſoil was a rich heavy loam, inclining to clay, in good tilth; drilled turneps in it the preceding year. The proportion of ſeed per acre was one peck, one gallon, and three quarts.—May 23d, it looked well in general, but a few plants were yellow and ſickly. On the 28th, I horſe-hoed off from the rows, and then turned the mould up

up againſt them again. It looked very flouriſhing. June 22d, being eight weeks and four days from the ſowing, the beard appeared. The plants had not tillered much, but ſeemed ſufficiently thick in the rows. On the 27th, I found ſome of the ears perfect: and July 2d, I mowed the middle of the alleys with Hewit's horſe-hoe; and threw up the earth, towards the rows, with a patent-plough. Auguſt the 17th, I picked out a conſiderable quantity of ſix-rowed Syberian Barley; the major part being the ſort with two rows. The 27th, I reaped.

Produce

	Pecks.	Gall.	Pts.	
Of double-rowed barley	2	0	3½	or at the rate of 13 b.
Of ſix-rowed ditto	0	0	7	1 p. 2 pts. per acre.
Total	2	1	2½	

Experiment No. 3. Syberian Barley.

A comparative trial between double-rowed Syberian Barley, received from Mr. Bayley, and common Engliſh barley, called *Ducks-bill.* The ſoil, condition, and preceding crop, were the ſame as No. 2. April the 20th, I drilled, in the ſame manner, on the ſame quantity of land as No. 2, two pints and a half of the Syberian Barley, at the rate of three pecks and one eighth per acre. — At the ſame time, I drilled

drilled the ſame quantity of Ducks-bill Barley, in the ſame manner, on an adjoining ridge, under the ſame circumſtances, with that, in which the Syberian Barley was ſown.—*Note.* The Syberian Barley weighed ſixty-four pounds per buſhel. The Ducks-bill weighed at the rate of ſixty-one pounds and a quarter per buſhel. The ſuperiority of the Syberian Barley to the Ducks-bill was therefore twelve pounds and three quarters per buſhel.

Minutes of the Syberian Barley.	*Minutes of the Ducks-bill Barley.*
May 23d. Seems too thick of plants.	
May 28th. Horſe-hoed off and on —	The ſame.
Appeared with broader leaves; and looked ſtronger than the other: but both well:	
June 22d. Seven weeks, and five days from ſowing, the beards appeared. Has not tillered much; nor is, I think, too thin, or not much ſo. It is remarkable, the beard of this, ſown 30th April, appeared as ſoon as of that ſown the 24th. It may be owing to the nature of the corn; the different ſtates of the ſeeds; or the ſeaſon.	Looks exceeding well; but little or nothing inferior to the other: but no appearance of the beards. Has tillered more than the other.

June 27th. Very many ears perfect: and, on one, I obſerved a bloſſom; and afterwards more bloſſoms on this, than on the other ſort. Some ears deſtroyed by the looſe ſmut; a ſign the ſeed was not old.	
July 1ſt.	The beard appears.
July 2d. Moved the earth in the allies, and threw up the crum againſt the rows.	The ſame.
July 13th. Pluckt off the ſmutty ears.	The ſame.
July 14th. The ſtalks ran high; and were large: but the ears hung ſo much down with their own weight, I feared, they could not ſupport themſelves till harveſt. They nevertheleſs did very well.	The ſtalks taller than that of the other: and this ſort looked, as if it would produce as much, if not more corn than the other.
Auguſt 27th. Reaped.	Sept. 6th. Reaped.
Produce of the Syberian Barley.	Produce of the Ducks-bill Barley.
More than two pecks and three quarters, or more than thirteen buſhels three pecks per acre, from three pecks and one quarter of ſeed.	Four pecks and one quarter, or twenty-one buſhels one peck per acre; ſo that the Syberian ſort ſhould be one-half more valuable than this, for a crop of it to be of equal worth: its produce being but about two-third parts as much, by this experiment in the Tullian drill-way.
Say thirteen buſhels clear: which is equal to ſeventeen buſhels per acre, when four buſhels of ſeed are ſown.	
A peck weighed fifteen pounds and fifteen ounces.	

A buſhel of this Syberian Barley would weigh ſixty-three pounds and twelve ounces.

A buſhel of the Ducks-bill, fifty-three pounds and four ounces, or per peck thirteen pounds and five ounces.

Superiority of the former, ten pounds and eight ounces.

The increaſe of the weight of this crop of Ducks-bill, being two pounds on the buſhel, it being ſo much greater than that of the ſeed, ſhews the corn improved in the land it was ſown on: which might, however, be more from the favourable ſeaſon for that grain, than the nature of the ſoil. The four ounces leſs weight of the Syberian barley on the buſhel, may be owing to a ſmall degree of degeneracy in our country. But it ſhould be noted, my peck, from the meaſure of which the laſt preceding weights were made, contained, at the time, about a wine-glaſs more than two gallons: as appeared from its having been ſince reduced to the Wincheſter ſtandard. This could make a difference of but two ounces in the buſhel. As to the meaſure of the ſeeds ſown, not having ſo large a quantity as a peck of Syberian Barley, I was obliged to have recourſe to our drinking-veſſels: which not being accurate, the preciſe weight per buſhel of that cannot be depended on. But the meaſure, both of the Syberian Barley and Ducks-bill, was equal in

in quantity at the time of ſowing: and though, from theſe circumſtances, the exact proportion of increaſe, or diminution of the reſpective grains in weight per buſhel, cannot be aſcertained, it is clear, the Ducksbill barley, on this crop, improved in its weight in compariſon with the Syberian. But, as this may poſſibly ariſe from ſome ſuperiority of the quality of the Ducksbill, no certain inference can be drawn from this obſervation. This will induce me to weigh my ſeeds of both ſorts, now raiſed in the ſame ſoil, and undergoing the ſame management, previous to my ſowing them for the next crops: and to weigh, alſo, afterwards, the produce of the crops.

You will, doubtleſs, conceive the minutes of the Engliſh corns in the preceding experiments have relation to the days named in the margin of the minutes of the experiments of foreign corn, when no other day is ſpecified, on the right-hand ſide of the black lines.

If theſe accounts ſhould be thought worthy to be laid before the Society, I deſire at the ſame time, the reſpects I bear to that uſeful and patriotic body, may be preſented to them; as I always ſhall be happy, in proportion to my ability, to promote their laudable deſigns: and I deſire you will believe me to be,

Your moſt humble ſervant,

R. PROCTOR ANDERDON.

Experiment on Syberian Barley, communicated by General *Elliot*.

RECEIVED five quarts of Syberian Barley with an ear of two rows.—This I call Numb. 1.

Received two quarts of the ſort with an ear of four rows.—This I call Numb. 2.

The land upon which both ſorts were ſown is a ſandy loam, very poor, dry in ſummer, but in winter much ſoaked with mineral ſprings, which in many parts break out on the ſurface: by this deſcription of the ſoil, it will be eaſily ſuppoſed, that common barley can hardly ſucceed upon it.—This field, the preceding ſummer, had borne a crop of winter-vetches mowed for ſoiling; after which, the land was plowed with an intention to ſow wheat on ridges under furrow from the flat: but the autumn rains came ſo ſuddenly, and continued ſo long, that the wheat ſeaſon was loſt; and the land left the whole winter in a deplorable condition. Laſt ſpring, the field was ſown, upon one plowing, with oats, and clover: reſerving the head-lands for Syberian Barley: which were manured with yard-dung, at the rate of eight hundred buſhels, or twenty loads to the acre.

Num-

Number 1.

April 23d. Drilled by hand, at ten-inch intervals, *five quarts* of ſeed, on *ſeven thouſand, ſeven hundred, and twenty-two ſquare feet:* nearly two-elevenths of an acre.

May the 5th. The blade appeared.

June the 2d. Came into ear.

June the 19th. Was hand-hoed.

Auguſt the 27th. Reaped.

Produce *five buſhels one peck*, each buſhel of nine gallons, weighed *ſixty-four pounds.*

Number 2.

April the 29th. Drilled by hand, at ten-inch intervals, *two quarts* of ſeed, on *two thouſand ſquare feet.*

May the 10th. Blade appeared.

June the 7th. Came into ear.

June the 24th. Crop was hand-hoed.

Auguſt 28th. Reaped.

Produce *three pecks:* weight *in proportion as Number* 1.

Some of the above Numb. 1, has been ground and bread made of it, which was very light and good; but had a particular acid taſte, reſembling (as one of my friends obſerved) that of malt. I think, this may poſſibly be owing to a ſmall proportion of common barley in the original ſeed, and over-looked in the griſt.

Halſtone, Jan. 2, 1772.

SIR,

THE Syberian Barley, you favoured Sir John St. Aubyn with laſt ſpring, ſeems to have undergone a fair probation on his land; having been ſown in the ſame field, the firſt week in May, and received the ſame treatment with barley of our own country. — The ſoil was rich, and deep; in which, I think, it will anſwer beſt: as the ſeed ſeems rather weaker than that of our own produce; and will, conſequently, in a light ſoil, in a wet ſeaſon eſpecially, fall flat, and not yield ſo plump a grain.— The Syberian Barley was ſown at the quantity of eighteen gallons to the acre; which is half the quantity commonly uſed of Engliſh barley; and it yielded a full third more than the barley that grew near it. One ſort, however, by no means, ſucceeded equally to the other, either in crop, or grain. Of the beſt, I incloſed you a ſample: the other was very thin and light; and, I fear, ſcarce worth the cultivation.

By Sir John's permiſſion, I tilled a pint of the Syberian Barley in a light ſoil, being part of my own land; giving it the very ſame treatment as other barley. The ſummer proving dry, I had expectation of a prodigious crop: but it ripened two weeks

weeks before the other corn (a circumſtance of which I was not aware); and the birds fell upon it, and diſappointed me of every grain. It ripened in the ſame manner, in Sir John St. Aubyn's land, twelve or fourteen days before the other: and about the time of its ripening, I obſerve, it ſhould be cloſely attended to; the grain being contained in a kind of ſhell; which, if left beyond its time, only a day or two, opens, and drops the grain, which is loſt.

On the whole, I think, it may be eſteemed a great acquiſition; and have no doubt of the advantages being felt in our country, in a few years.

I am, Sir, with great reſpect,

Your moſt obedient,

and humble ſervant,

R. JOHNS.

Account of Syberian Barley, given to the Society, in part of a letter, from a gentleman in Shropſhire, who ſigns himſelf *A Shepherd**.

October 3d, 1771.

I am greatly obliged to you for the ſample of Syberian Barley you was ſo kind to ſend me. It came about a month too late; I ſet it the 4th of May in rows of a foot aſunder, and four inches grain from grain, in a garden, under the ſhade of a large apple-tree, with a hedge to the ſouth, and the ſhade of another hedge to the weſt. The ground was rich; and I had no alternative. It was all up in leſs than ten days. I had it hand-hoed once, and afterwards hand-weeded; but dry as the ſummer was, it was very much lodged. I never ſaw any thing ſtole like it. Upon an average, there was not leſs than ten ſtalks from every grain: and twenty-four, at leaſt, corns in every ear. The birds, and chickens deſtroyed three-fourths of my crop. Almoſt every one, that ſaw it, ſaid, I ſhould have

* This extract is part of a letter, explaining part of another letter below inſerted, on the ſubject of winter-vetches. The gentleman, who wrote it, has choſen to correſpond with the Society under the ſignature of A SHEPHERD; but has made his name known to the ſecretary.

a buſhel

a buſhel of barley from about one-third of half a pint of ſeed; but I am fearful, I ſhall not have above a peck. It came up in three different ſuits: it is a noble grain; and will make, I have no doubt, very good browniſh bread. I am fearful, that when malted, it will be too high-coloured for Shropſhire, and Staffordſhire ale; and that though ale made of it will not readily get fine, it may probably make good malt for porter. My grand objection to it is the coarſeneſs of the ſtraw.—Many farms have little or no meadow-ground; and depend chiefly upon their barley-ſtraw for food for young cattle in winter. I am apprehenſive, the Syberian Barley ſtraw will not anſwer that purpoſe.

My barley, in general, is much larger than that you ſent me. I intend ſowing it early, very thin, under a ſlight furrow, in the middle of a turnep-fallow. I wiſh my apprehenſions may prove groundleſs. New things are apt to make us too ſanguine. Twenty corns of my barley weighed as much as forty of white wheat.

Extract

Extract of a letter, from Mr. *Reynholds*, relating to Syberian Barley, read to the Society, in 1774.

IT may, perhaps, be acceptable to ſhew you the experiments made in 1773, both on Syberian Barley, and common barley.

I made three ſowings—1ſt, two acres in February,—2d, two acres in March,—3d, two acres in April. The 1ſt was on fallow: the ſecond on clover-lay: the 3d on wheat-ſtubble.

The ſeed was *two buſhels* per acre for all the three.

The fallow proved beſt: there was little difference betwixt the other two.

The average produce was thirty-one buſhels, and three gallons, per acre.

The common barley was ſown on the ſame land, at the ſame time; a like allotment of two acres, being made to each kind;—but the proportion of ſeed was *three buſhels* to each acre.

Here again the fallow proved beſt: and the other two were alike.

The average produce was twenty-three buſhels, and two gallons per acre.

The difference, therefore, in the produce (allowing for the difference of the quantity of the ſeed ſown) was four buſhels

buſhels and one gallon, per acre, in favour of the Syberian Barley :—and the difference in weight of the reſpective grain was ſix pounds, per buſhel, in favour of the ſame.

We find the Syberian Barley makes good wholeſome bread, mixed half and half with wheat; but not alone. I obſerve, this naked barley grows taller; and ripens ſooner than the common, by ſeven or eight days.—The ſtraw, I believe, is ſuperior too. For it is ſtronger; and retains the chaff which covers the grain; conſequently muſt, I think, have the preference on theſe two accounts: and I find my cows eat it greedily.

ARTICLE

ARTICLE II.

Accounts of the Culture, Produce, and Qualities of the Species of Corn, called SPRING-WHEAT, SWITZERLAND WHEAT, *or* BLED DE MARS, *communicated, by ſeveral Gentlemen, to the* Society for the Encouragement of Arts, Manufactures, and Commerce, *and inſerted at their Requeſt.*

To *Robert Doſſie*, Eſq.

SIR,

THE Society for the Encouragement of Arts, Manufactures and Commerce, have directed me to deliver to you *the ſeveral accounts of the grain, called Spring-Wheat*, communicated to them by Mr. *Eaton*, Mr. *Ramey*, Sir *Digby Legard*, and Mr. *Anderdon*, in order to their being inſerted in the Memoirs of Agriculture, if you think proper.

I am, Sir,

Your very humble ſervant,

SAMUEL MORE, ſec.

SIR,

SIR,

LAST ſummer, I received, by the hands of my brother, a ſilver medal from the gentlemen of the Society of Arts, &c. as a teſtimony of their approbation of my conduct, with regard to the cultivation of SWITZERLAND WHEAT, or SPRING-WHEAT. I ſhould have acknowledged this favour immediately, by letter, but was informed, that it was not expected; and was at that time unneceſſary: the meeting of the Society being adjourned for the ſummer ſeaſon. Beſides, I thought, that mere thanks were not a compenſation adequate to the honour conferred upon me; and that the Society had an undoubted claim upon me for ſomething more ſubſtantial, and ſatisfactory.—I have given, in the incloſed papers, a particular account of the different methods, by which I have cultivated this wheat: the various ſoils in which I have ſown it: and the different ſucceſs which has attended my ſeveral experiments: and I have ſubjoined the obſervations, which have occurred to me, during the practice and experience of three years.—

I muſt beg the favour of you to preſent my thanks, to the gentlemen of the Society, for having thought me worthy of this diſtinguiſhing

tinguiſhing and unſollicited mark of their approbation; and aſſure them, I ſhall be always ready to forward the intereſts of huſbandry, and the much to be commended views of the Society. It was only with this view, that I prevailed upon myſelf to write out the incloſed account; and to ſubmit it to their peruſal. If it affords them either inſtruction, or entertainment, I ſhall think myſelf ſufficiently recompenſed for the trouble, which it has coſt me.

I am,

Your obliged humble ſervant,

Deen, near Rockingham,
January 1, 1772.

D. EATON.

Spring-wheat cultivated by Mr. *Daniel Eaton*, of Deen, in Northamptonſhire.

THE autumn of the year, 1768, was very rainy: and a great deal of land ſown with wheat was in ſuch bad order, that we had but little reaſon to expect a plentiful crop. I was ſoon afterwards in company with an ingenious friend, whom I deſired to procure, for me, ſome SWITZERLAND WHEAT, or SPRING-WHEAT; which, he informed me, would ripen well, if ſown in March. Accordingly he, with much difficulty, got one buſhel. The grain was ſmall in ſize, and ſhrivelled, with a mixture

ture of different kinds of barley, and oats in it. Upon the whole, it made a very unpromiſing appearance: and it came ſo late in the ſeaſon to my hands, that I had not time to ſeparate the trowſe from the wheat; but was obliged to ſow all ſorts together: which, I have ſince much lamented.—On the 17th of March, 1769, it was drilled (in equal diſtant rows, ten inches aſunder), on three roods of land in very good condition; having been cabbages in 1767; and Windſor beans in 1768: the intervals between the beans horſe-hoed very deep.—On the ſame day, and in the ſame field, was drilled (as above) half an acre of Lammas wheat, in order to form a judgment of their comparative merits. The Switzerland wheat was ripe as ſoon as my autumn-ſown Lammas wheat; and produced twenty-three buſhels. The Lammas wheat never did ripen, but was mildewed. The ſtraw turned black; and was nearly rotten before it was reaped: which was not done until after the other harveſt was finiſhed. When threſhed, it yielded ſeven buſhels: and that was ſo lean, and bad, as not to be ſuperior to good barley; and ſufficiently proved which ought to have the preference.

In my obſervations of this ſpring-wheat, during the ſummer, I ſaw plainly, that there were two different kinds: one beard-

ed

ed like the grey wheat; the other a pollard ear. This induced me to try each ſort ſeparate, to know, if there was any material difference. Accordingly, I ſelected ſome ears of the bearded: and my friend, who procured this wheat for me, ſelected the pollard ſort, out of ſome which he cultivated.—Three buſhels of each ſort were raiſed in 1770, and ſown, by me, in 1775, of which further notice will be taken in its proper place.—

Having met with good ſucceſs in the firſt trial, I proceeded again in 1770. March the 3d, two acres were drilled with Spring-wheat, in a field of twelve acres (after turneps): the ſoil a red kale, with a mixture of mortar-earth, and ſome parts clay. March 27th, 28th, 29th, and 30th, ſeven acres more of land were drilled in the ſame cloſe. April 4th and 5th, three acres more finiſhed the field. The laſt three acres were deſtroyed by the wire-worm, or grub. The firſt ſown (two acres) did not yield ſo good a crop, as the ſeven acres. The ſeven, and two acres, produced eighteen quarters of wheat. This crop was ripe before any of my autumn-ſown Lammas wheat. The early ſown had no advantage in ripening ſooner than the later ſown. From my obſervations of this crop, it plainly appeared, that this kind of wheat is not proper for the drill, unleſs the rows are very near together.

gether. It does not tiller out like other wheat; and, therefore, ſtands too thin upon the ground; but I was willing to make my ſeed go far.

The autumn in 1770, being uncommonly wet, a great deal of land intended for wheat could not be ſown; and much that was ſown, was ſo injured by exceſſive rains, that the proſpect of a crop was very doubtful. I, therefore, truſted part of my land for the Spring-wheat.—March the 20th and 21ſt, 1771, I ſowed broad-caſt three acres and ſix poles, with four ſtrikes of the mixed kind, and three ſtrikes of the pollard wheat. At the ſame time, one acre, and one rood, in this field, was ſown with the bearded wheat (three buſhels of ſeed). This field had a crop of drilled turneps, without manure, the preceding year: the ſoil a light earth upon a limeſtone.—A deep ſnow falling about the 20th of April, this crop was very much injured by the rooks: in about two days they deſtroyed near half the wheat, which was at that time juſt beginning to appear above ground: or elſe the crop would have been a very good one.—I cannot aſcertain the produce of the three acres and ſix poles. I have not threſhed it at preſent; becauſe it will not be wanted for ſeed until March; and, if it is threſhed at this ſeaſon of the year, it is in danger of becoming fuſty, by lying ſo long out of the ſtraw in the winter-

months.—The one acre, and one rood, ſown with bearded wheat, as mentioned above, produced three quarters, two buſhels, and three pecks; and is very fine wheat. This kind has a large ear, better filled, and the ſheaves far more weighty than the pollard ſort; and, conſequently, muſt yield far better. It is not ſo liable to be ſmutty as the other: at leaſt, in this trial, it appears ſo. Twenty-four ſmall ſheaves of the bearded, indifferently choſen, produced one buſhel, one peck, and one pint.—The weight of one buſhel is ſixty-ſix pounds: the weight of my beſt Lammas not quite ſixty-four pounds. Our cuſtomary meaſure is near thirty-four quarts.

My next trial was in a field containing upwards of thirty acres; a black looſe earth upon a clayey, cold, indifferent land, and very liable to be injured by froſts and heavy rains. This field was ſummer-fallowed in 1770.—October the 2d, I began to ſow it with Lammas-wheat: but heavy rains falling the 13th, ſix acres could not be ſown that ſeaſon.—March 26th and 27th, three acres, three roods, and twenty poles of the remaining part, were ſown with Spring-wheat.—This crop was ripe, and I began to reap it Auguſt the 23d. The Lammas-wheat, ſown as above mentioned, was not ready until Sept. the 2d: and, even then, the lands adjoining to the Spring-wheat were not ripe, but mildewed; and

and were but rather green. At laſt, it was injured much by the winter rains, and ſpring froſts; and is not likely to yield ten buſhels an acre: whereas the Spring-wheat is judged to produce double that quantity, and not inferior to the Lammas in quality. —Another field of clay-land, that was drilled with beans in 1770, the intervals horſe and hand-hoed, was intended for wheat. But the exceſſive rains in October prevented my ſowing more than one third with wheat. —March the 29th and 30th, I ſowed two acres, and a half of the remaining part, with Spring-wheat: which I began to reap Auguſt the 23d. It was a fair crop: but rather thin: the land in weak order. It produced three waggon-loads. The quantity, I cannot aſcertain, as the wheat is not threſhed; but may reaſonable expect eighteen buſhels an acre. The Lammas-wheat, in the ſame field, produced not more than twelve buſhels.—April 8th and 9th, I ſowed nine buſhels of Spring-wheat upon four acres, and thirty poles of land, a clay ſoil upon a lime-ſtone.—This was a very pretty crop; and produced five good waggon-loads, computed to contain ſixteen or eighteen buſhels, each load. The land is naturally poor, had a crop of barley, in 1769 (after peaſe and turneps); beans were drilled on it in 1770; and horſe-hoed in the intervals; which were ſowed with turneps;

and fed off with ſheep at the latter end of March, and beginning of April. This wheat, though ſown ſo late, was quite ripe; and I began to reap it the 27th, two days before any of my autumn ſown Lammas wheat was ready.

From the experience of the three years, in which I have cultivated this kind of wheat, ſeveral obſervations have occurred worthy of notice.—FIRST, *the ſtate and quality of the wheat.*—This wheat had been cultivated with the greateſt negligence, and indifference for ten or twelve years, ſo that it was grown wild; and had degenerated for want of good huſbandry, and changing the ſoil. When I received the firſt buſhel, it was very ſmall, and lean; and ſcarcely deſerved the name of wheat. It had always been ſown in the ſame place, and was mixed with other kinds of grain; an inconvenience, which it will always be liable to, without the greateſt care, and caution; and though I have been at great expence to pick out the barley, and oats, I have not been able to do it effectually. The quality of the grain in ſize, boldneſs, and weight, is much improved in the three years, that I have ſown it: and I doubt not, but good management, with proper and frequent changes of the ſoil, will render it more valuable than at preſent. The firſt buſhel, I ſowed, was no heavier than

Barley;

barley; the crop in 1769, weighed fifty-eight pounds a buſhel; in 1770, fifty-nine pounds a buſhel: this year the common or pollard ſort weighs ſixty-ſix pounds; the bearded ſort ſixty-ſix pounds, as before mentioned. This is a plain, and ſufficient proof, how much the quality is improved: having gained ten pounds a buſhel weight in ſo a ſhort time, as three years.—SECONDLY, *the time of ſowing, and proper quantity of ſeed.*—The beſt time for ſowing this wheat, like other kinds of grain, muſt in ſome meaſure be regulated by the nature of the ſoil, and ſeaſon. It is a general obſervation, that Spring-corn cannot be ſown too early, if the land will work kind, and well. But, I muſt confeſs, that I have found no advantage in ſowing this wheat early in the ſpring, (though well ſown): and thoſe perſons, who ſowed it ſoon, laſt year, in this neighbourhood, derived no advantage from it. The time, that I would recommend it, if the weather permitted, is between the 20th and 30th of March. If ſown within that time, it will be ripe as ſoon, as if ſown a month, or ſix weeks earlier, the produce equal if not ſuperior: and it will be much ſafer from the rooks, and vermin, who prefer this wheat to any other ſpring-corn: as I have experienced to my coſt.—The proper quantity of ſeed, I have not yet found out. I having but a

ſmall quantity of ſeed to begin with, endeavoured to make the moſt of it: and, therefore, have hitherto ſown it too thin. This kind of wheat has ſo ſhort a time to vegetate, and bring its ſeed to maturity, which is done in about twenty-one weeks from the time of ſowing, that nature has ordained, it ſhould loſe no time in its progreſs towards the harveſt, by tillering out like the Lammas, and other autumn-ſown wheat. But it ſhoots upwards immediately from its firſt appearance above ground: few roots producing more than three or four ears: and many but one, or two. Perhaps it may do more on lands more fertile than mine; which are in general cold, and indifferent.—If this wheat is not ſown thicker than the common ſort, it will always be too thin upon the ground. I think, three buſhels a proper quantity for a ſtatute acre: though perhaps it may be better to ſow more on ſome kind of land. But leſs, I find, will not be ſufficient. If I had ſown this quantity laſt year, I believe I ſhould have reaped at leaſt five or ſix buſhels more on every acre.—The principal defect in this wheat is the ſmutt, to which it is at preſent exceſſively addicted: inſomuch that, I think, the loſs occaſioned by it in my crop will not be leſs than three or four buſhels an acre. This, I ſuppoſe, to have happened by the neglect of good

huſbandry,

huſbandry, for ſo many years, with reſpect to the corn, that produced my firſt ſeed. We know, that bad habits, long contracted, are not ſoon cured: and we always obſerve, bad farmers ſuffer the moſt by this evil. It ſeems, therefore, as if Providence had ordained, that the prince, or firſt of grain, ſhould be liable to this malady, in order to be a ſpur to our care, and induſtry. I have great hopes, this defect will be overcome by a proper change of ſoil; and taking care to ſow only the ſhorteſt and boldeſt grain: which is eaſily done, by careful dreſſing, and a good ſcreen. In regard to this defect, the bearded kind deſerves the preference; having but few ears injured, in compariſon to the other ſort, and for this reaſon as well as thoſe before mentioned; it deſerves moſt to be cultivated.—My LAST obſervation is *on the advantages ariſing from the culture of Spring-wheat.* To recommend this grain, in preference to the other ſorts, would be inconſiſtent with reaſon and experience. Better kinds, perhaps, can never be found than thoſe in common uſe, which ought always to be preferred where and whenever the ſoil and ſeaſon will permit: but to have a ſubſtitute, that will anſwer nearly the ſame purpoſe, and ſupply with grain of equal weight and value in ſuch a year as the laſt, is ſome conſolation, and deſerves the notice of the public. It

is in ſome meaſure commanding the ſeaſons, by giving us the opportunity of declining to ſow wheat in a bad autumn; and enabling us to make the chance of a favorable ſpring. Thus far, at leaſt, it may be of ſervice in all ſoils; and is worthy to be recommended.—But it claims a more particular attention in ſome ſituations. For inſtance, in ſuch low countries as are liable to be over-flowed by winter rains.—In the Lincolnſhire fens, the Iſle of Ely, the low parts of Holderneſſe, and many more, if wheat is ſown before winter, the danger of loſing the crop, by the floods, is very great: and, if ſowing is delayed until Candlemas, the corn ſeldom ripens to perfection: the grain is very lean; and produces but little flour. In thoſe countries, the Spring-wheat will be more ſecure. It may be ſown, when the danger of the winter-floods is over; it will ripen long before their Lammas-wheat, though that be ſown in autumn; and it will be equal, though not ſuperior in quality. In this caſe, the advantage in favour of this kind of wheat is plain, and manifeſt. It may, alſo, be worth cultivating in the mountainous parts of Yorkſhire, in Craven, in the high parts of Lancaſhire, Derbyſhire, and many others, where little, or no wheat of any kind is ſown; the ſituation being too cold for wheat ſown in autumn, to ſtand the ſeverity of

the

the winter froſts and rain without periſhing. I have no doubt, but that Spring-wheat may be cultivated in thoſe parts with great ſucceſs; and be very ſerviceable to the country. If it was ſown in March, or the beginning of April, it would ripen as ſoon as their oats, and other grain; and be much more advantageous to the farmer. —To ſome parts of the countries above mentioned, wheat is conveyed on horſeback forty or fifty miles: which is a vaſt expence; and raiſes the price very high to the conſumer. More might be ſaid in favour of Spring-wheat: but what is here related is ſufficient to ſhew, that it may be cultivated in many places to great advantage; and will be of great ſervice after a wet winter.—The truth has not been exaggerated in one inſtance, in order to deceive the public; but every part fairly, and candidly ſtated.

Jan. 1ſt, 1771.

Extract of a Letter from Mr. *Ramey* *.

Experiments and Obſervations on Bled de Mars, or Spring-wheat of Switzerland.

I received half a peck of this ſeed from the Society: and on the 21ſt day of March

* The other part of this letter being on Syberian Barley, is inſerted in the firſt article, page 13.

laſt,

laſt, it was ſown in ridges, by my gardener. In the ſame incloſure, and on the ſame day, a like quantity of red wheat, of my own growth, was ſown near it.

On the 20th of June, the foreign wheat was in the ear: and, amongſt it, a great quantity of ſmutty, or black wheat.—The Norfolk wheat was not in the ear, till three weeks after; but was then more vigorous than the foreign; was quite clear of ſmut, or black wheat; and ripened well. The ſeed of both was prepared in the uſual way.—

The produce of the Norfolk red wheat was more than as much again in quantity; and the quality greatly ſuperior.—So that, by this trial, it appears, that the foreign wheat is of no value; for that, in any tolerable ſummer, our Norfolk wheat will ripen, though ſown in March; and that both the quality and produce are infinitely ſuperior.

10th Dec. 1771.

Ganton, 10th April, 1772.

SIR,

HAVING made an experiment with the Spring-wheat, which the Society for Encouragement of Arts, &c. was ſo obliging as to ſend me laſt year; and being now able to give an exact account of its produce,

produce, I beg the favour of you to communicate to them the following detail.

As ſoon as I was acquainted with the deſire of the Society, that I ſhould make a particular experiment of a kind of wheat, which came from Switzerland, and which is ſaid to grow well, and come to perfection in our climate, if ſown in ſpring, I reſolved not only to be careful in the trial, but to give this grain every advantage of ſoil and culture, which its character ſeemed to demand. It appeared neceſſary, alſo, to ſow other kinds of wheat, under the ſame circumſtances of time, ſoil, &c. in order to judge of the comparative excellency of this ſort: it being a matter of ſome importance, to be fully informed, what kind of wheat will be moſt perfect, and yield the greateſt produce, if ſown in ſpring, at thoſe times, when, from a bad ſeaſon in autumn, or other accidents, the farmer has been interrupted in the uſual and regular time of ſowing.

The land I appropriated to this experiment is a rich ſandy loam, perfectly ſuitable for turneps, and barley; and not improper for wheat: except that it was ſcarce ſtrong enough for that grain. It had produced three or four good crops; the laſt of which was turneps, fed off by ſheep.—After once plowing, and harrowing, I drilled two pecks and a half of the Switzerland wheat,

wheat, on half an acre of this land, the 22d of April laſt, in equal diſtant rows, one foot aſunder. Half an acre was ſown at the ſame time, and in the ſame manner, with Syberian wheat, or barley, which Dr. Hunter made me a preſent of. This took two pecks. Two acres three roods were, alſo, ſown with the common white wheat; and took four buſhels.—The land all laid contiguous in the three experiments. All the ſeeds was limed; and every circumſtance equal, except that the two laſt ſorts were drilled on the ſecond and third of April; but the Switzerland wheat not till the 22d.—Each ſort came up well, only the Syberian barley ſeemed too thin in the rows: and though the hand-hoeing made it tiller, and in ſome meaſure ſupply the deficience, yet, either, from ſome defect in the ſeed, or for other cauſes unknown to me, it was too thin; and the ground was never completely ſtocked with plants.—All the wheat of the three experiments, looked healthy, and vigorous: but the Switzerland ſort was manifeſtly the fineſt, and forwardeſt. They all grew well, ripened kindly, and were cut the latter end of Auguſt.—The Switzerland wheat was about ten days earlier than the others; and full as forward as any wheat in this country. The whole ripened thoroughly; the produce was as follows, viz.

Two

	Qr.	B.	P.
Two pecks of Syberian barley, from half an acre, produced - - -	1	4	2
Four buſhe's of Engliſh wheat, from two acres and three quarters, produced -	10	0	0
Two pecks and a half of Switzerland wheat, from half an acre, produced -	2	4	3

The rate of encreaſe from the firſt, twenty-fold: from the ſecond, twenty-fold; and from the third, thirty-three fold. — The bread, pyes, and puddings, made of this were good, but not equal to the beſt Engliſh bread. However, as this grain ripens early and well, when ſown ſo late, as the 22d of April; and as the increaſe is ſo conſiderable, as to amount to above five quarters per acre; it muſt be allowed, even though the quality be inferior to our beſt wheat, that this kind of Spring-wheat is a great acquiſition in agriculture.

I am, Sir,

Your moſt obedient,

and moſt humble ſervant,

D. LEGARE

Extrac

Extract of a letter from Mr. *Anderdon* * relating to his experiments on Spring-wheat.

Experiment Numb. 4.

A comparative trial of Switzerland, or Spring-wheat, with common Engliſh white-wheat.

The ſoil, condition, &c. of this, and Numb. 5, were the ſame as in Numb. 1, 2, and 3.‡

April 6th. Drilled in the ſame manner of Numb. 2 and 3, one double row, a twentieth part of an acre, with the Spring-wheat, at the rate of ſix pecks and a half per acre.

The ſame day, drilled, in ſame manner; ſame portion of ground adjoining; with the ſame quantity of the Engliſh wheat.

Minutes of the Spring-wheat.	*Minutes of the Engliſh.*
May 5th. Between two and three inches high: looked well.	The ſame: no apparent difference between them.

* The other parts of this letter, reſpecting the culture, &c. of Syberian Barley, is inſerted before in Article I. page 29.

‡ The paſſages, in the foregoing part of this letter, here referred to, are before inſerted in Article I. and will be found page 30 and 31.

N. B.

N. B. No conſiderable rain till laſt night, ſince the crops were ſown: and, from the favourable ſtate of the ſoil, and proſperous condition of the plants, I doubted, if both ſorts might not have vegetated to perfection by the moiſture of the dew only, and help of the horſe-hoeing, if no rain had fallen from ſeed-time till harveſt.

Minutes of the Spring-wheat continued.	*Minutes of the Engliſh continued.*
May 23d. The corn appeared to be too thick.	The ſame.
May 28th. Horſe-hoed.	The ſame.
Taller and more flouriſhing; and the blades broader than of the other: looks healthy. -	Looks healthy; and inclined to tiller more than the Spring-wheat
June 17th. This corn a foot high. - -	This only half a foot: but tillers more.
June 20th. Two feet high, and begins to ſwell for the ear. - -	Only one foot high.
June 23. Eleven weeks and two days from ſowing; ſwells greatly, with the ear; and appears not too thick in the rows. -	
June 28th. A great part of the ears fully out. -	
July 2d. Mowed the middle of the alleys; and threw up the fine earth againſt the corn. -	The ſame.
July 6th. In bloſſom: many ears between five and ſix inches long. - -	This ſort does not yet ſwell for the ear. Is certainly too thickly ſown.
July 11th. In full bloſſom.	Swells with the ear.

Many

Many black ears gathered. I fear the ſound corn was affected, by their being left ſo long. -	
July 21th. The bloſſom nearly gone off. -	*Sept.* 16th. Reaped. Both ſtalk, and ear exceedingly ſtruck with the ruſt while in bloſſom.
Aug. 17th. Reaped: but the ſmall birds had made vaſt devaſtation. -	
Produce.	Produce.
Only one peck, and three pints, not ſix buſhels per acre, weight per peck, fifteen pounds and ten ounces.	Two pints: or two pecks and a half, per acre.

Obſervations.

From this experiment, neither the Spring, nor Engliſh wheat, ſown ſo late in the ſpring as April, ſeems at firſt an object worthy the huſbandman's care. Though good crops of the latter, ſown late in March, have happened in this neighbourhood. The ravage done by the birds to the former was greater than I ever knew, or heard to have befallen any corn. I believe, they robbed me of half the crop: which, therefore, but for this diſaſter would have been no very deſpicable one, according to the mode of culture; and, as the damage by the birds, might not have been conſiderable in a large field of this Spring-wheat, it appears to me a deſirable grain,

to

to propagate; at leaſt in ſome certain places, and caſes: viz. in large, or open fields, when the proper ſeaſon to put in our own country wheat turns out too bad for it: or when it ſuits the farmer to have wheat after turneps: as it would enable him to eat his turneps when, and not before they are moſt wanted: or when the winter-ſeaſon turns out ſo bad, as very greatly to damage the wheat in the ground; or in bleak expoſures.

Experiment Numb. 5.

Another comparative trial between Spring-wheat, and Engliſh white-wheat.

April 30th. Drilled half a peck of each ſort, in double rows, one foot aſunder, on two diſtinct ridges of five feet each.

Seed at the rate of five pecks per acre.

The weight of the Spring-wheat was four pounds, or in the proportion of ſixty-four pounds per buſhel.

The Engliſh was four pounds and a half, or ſixty-ſix pounds and a half per buſhel.

N. B. The foreign corn was conſiderably ſmaller than the Engliſh: but the latter, being heavier, ſhed rather faſteſt; yet not conſiderably.—The drill uſed in this, and the other experiments, was Mr. Willis's horſe-hoe.

Minutes of the Spring-wheat.	*Minutes of the Engliſh wheat.*
May 23d. Appeared to be ſown too thick.	Appeared too thick.
May 29th. Horſe-hoed from, and to the rows. Very flouriſhing; more ſo than the other; and broader blades.	Horſe-hoed. Flouriſhing, but not equal to the Spring-wheat.
June 7. Half a foot higher than the Engliſh.	Tillers more then the Spring-wheat.
June 23d. A foot higher than the Engliſh,	
July 2d. Mowed the middle of the alleys; and threw the fine mould againſt the rows.	The ſame.
Many of the ears perfectly out.	
July 6th. Ears ſhort in compariſon to what was ſown the 6th of April.	Looks yellow. Does not ſhoot up into ſtalks; and appears as if it would come to nothing.
July 12th. In bloſſom.—plucked ſmutted ears.	
July 14th. In full bloſſom; ſtood well, and looked flouriſhing; but the ears continued to be conſiderably ſhorter than what was ſown in April.	
July 21ſt. Bloſſom gone off.	*July* 21ſt. A few ears only ſhot up.
Aug. 17th. Reaped; but greatly hurt by birds, which attacked the ears even while green.	*Aug.* 17th. A few ears perfected, and in bloſſom; and a few more ſwelling out.
	Sept. 6th. So much of it, as had ſhot up was in bloſſom.
Produce.	*Oct.* 2d. Bloſſom ſtill continues. Rubbed a few of the forward ears: ſome produced no corn; ſhed a few, but very thin.
One peck three pints: or per acre leſs than ſix buſhels.	No

buſhels. Weight of a peck, fifteen pounds five ounces. - -	No corn came to perfection.
N. B. The ſtalks were attacked by the ruſt; but, after the bloſſom was gone; ſo it is preſumed, the ear eſcaped injury.	*March* 1772, Theſe plants are ſtill in the ground: and, I believe, will perfect corn this year: but in no great quantity.

Obſervations.

It is remarkable, that, contrary to the nature of theſe kinds of grain, of the growth of our own country, the Spring or Switzerland wheat, ſown the ſame day as the Syberian barley, viz. 30th of April, was ripe ten days before the barley: that is, the former the 17th, and the latter the 27th of Auguſt. And it may here be noted, that Switzerland or Spring-wheat, the Syberian barley, (and alſo the Poland oat), all of which ripen earlier than the ſame ſpecies of corn uſually propagated with us, have each of them a broader leaf, or blade, than our own country corn.—May it not, therefore, reaſonably be preſumed, that theſe broader blades greatly forward the corn to perfection, by imbibing through their pores, a vaſt ſhare of nouriſhment, to the plants, from the atmoſphere; and granting that to be the caſe, is it not as reaſonable to ſuppoſe, theſe foreign corns have leſs occaſion for, and do actually exhauſt

the ſoil leſs of its vegetative food than the ſame ſpecies of corn of our own country? The event of theſe experiments ſhews, that the Spring-wheat, ſown ſo late as the 30th of April, will come to perfection; the Engliſh not: and that the former ſown ſo late as the 30th of April, ripens as ſoon (at leaſt it did ſo in theſe trials) as if ſown the 6th. But that the produce of Spring-wheat ſaved of Numb. 5, is equal to that of Numb. 4. As it is impoſſible to aſcertain the damage done by the devaſtation of the birds, no certain concluſion of compariſon can be drawn from thence: yet the ears of Numb. 5, ſown the 30th of April, being conſiderably ſhorter than thoſe of Numb. 4, ſown the 6th of April; and the peck of corn weighing five ounces leſs, ſeem clearly to demonſtrate, that the earlier in April this corn is ſown, the better, in proportion, it may anſwer: and it ſtrikes me, as no immaterial circumſtance, to aſcertain by experiments the moſt proper times for ſowing thoſe foreign corns in our iſland; which cannot, otherwiſe, be ſo well known. With that view, I have ſown, this month, both Spring-wheat and Syberian barley; and propoſe comparing the products with thoſe of the like corn, which I intend to ſow as early as I can in next month, on ground adjoining in the ſame field.

field. The few grains of French wheat, you was ſo kind to give me, I planted in the manner of the Syberian barley, Experiment Numb. 1: and on the ſame day, viz. the 11th of April. The corn perfected. Moſt of the plants died: a few are ſtill living, and may bear corn this year.

ARTICLE III.

Certificates, and Accounts of WHEAT SOWN IN THE SPRING; *in which*, the Particulars of the Culture, and the Produce, and Quality of the Grain, are ſpecified; in order to the determining, how far that Practice may be OCCASIONALLY advantageous, *exhibited in claim of the Premiums, or communicated, for the public Benefit, to the* Society for the Encouragement of Arts, Manufactures, and Commerce; *and inſerted at their Requeſt.*

To *Robert Doſſie*, Eſq.

SIR,

THE Society for the Encouragement of Arts, Manufactures, and Commerce, have directed me to deliver to you *the ſeveral certificates*, and accounts of*

* In 1769, the Society offered a premium of fifty pounds, or a gold medal "to the perſon, who ſhould cultivate "the greateſt number of acres (not leſs than fifty) with "wheat, the enſuing ſpring, after the firſt of February: "ſpecifying in the certificates of ſuch culture, the "number of ſheaves produced."—This premium was not propoſed with a view to encourage the general cultivation of wheat in the ſpring: as it is juſtly deemed to be, in common caſes, a diſadvantageous practice to the farmer, from the crops being for the moſt part inferior to thoſe of the autumn culture, and from the great inconvenience

Wheat ſown in the ſpring, exhibited to the Society in claim of their premiums, or communicated

convenience attending, (with the hazard frequently of the loſs of ſeaſon) which would thence reſult, by bringing together the whole work of preparing the land for, and ſowing all the kinds of corn at one time, inſtead of dividing it betwixt the autumn and ſpring. But in the autumn of 1768, there had been ſuch great and conſtant rain, that, in the lower countries, and level grounds, it had been rendered impracticable, in many places, to ſow the wheat at the uſual time, or what had been ſown had been deſtroyed; and conſequently ſo much of the beſt land, intended for that grain, lay in a waſte ſtate, that it gave reaſon to fear a ſcarcity of wheat would be occaſioned by it. The Society, therefore, were induced to believe, the ſowing this land with wheat in the enſuing ſpring, might in ſome degree avert the impending evil: having good aſſurance, that moderate crops might, with favourable circumſtances, be obtained even from later cultivation; and that, if they were not ſo great as might be expected from the autumn culture, the advanced price, occaſioned by the ſcarcity of corn, would compenſate to the farmer for the deficiency of the quantity of ſuch crops.—At the ſame time, this encouragement from the Society afforded an opportunity for obtaining, from ſuch as might become candidates, a large ſcope of information, from actual trials, of the difference betwixt the crops of wheat ſown in the ſpring, and thoſe of that ſown in the autumn: whence a judgment might be formed, how far, in ſimilar caſes of the loſs of ſeaſon in the autumn, either from general cauſes, or particular accidents, the cultivation of wheat in the ſucceeding ſpring might afford a proſpect of advantage, either to the public or the farmer.

The firſt certificates, with Mr. Shaw's account of his experiments, and Mr. Carr's obſervations on the ſowing wheat in the ſpring, were the reſult of this premium. They gave juſt reaſon to believe, that the culture of wheat in that ſpring had been very beneficial to thoſe

municated to them for the public benefit, in order to their being inſerted in the Memoirs of Agriculture, if you think proper.

I am, Sir,

Your very humble ſervant,

SAMUEL MORE, ſec.

Mr. *Steward*'s certificate of ſowing wheat in the ſpring, 1769.

WE, whoſe names are underwritten, do certify, that Mr. John Steward of Roſs, in the pariſh of Belford, and county of Durham, did, after the firſt day of Feb. 1769, cultivate ninety-ſeven acres, and one rood * of land, with wheat: which wheat was

farmers who had practiſed it: and there were many collateral facts, of which the Society had other intelligence, which confirmed the opinion.—The Society were led by this ſucceſs to offer the ſame premium again in the year 1771, requiring a more explicit account of the culture and produce than had been called for in the conditions of the firſt. The certificates and accounts, with a correſponding date, were the conſequence of this premium: and they greatly corroborate the proofs afforded by the former, of the expedience of cultivating wheat in the ſpring, where the opportunity has been loſt, from general cauſes, of ſowing it in the autumn; or where it has been deſtroyed after it was ſown.

* This number of acres, for which Mr. Steward put in his claim, being much greater than that of any other candidate

was begun to be ſown, on the ſaid land, the ſixth day of March, 1769; and was all ſown, on the ſaid land, by the fourth day of April following.—And we do alſo teſtify, that the above ſaid land, ſown, at the time as above mentioned, with wheat, did produce the preſent harveſt, 1769, of ſheaves* of wheat, forty-two thouſand one hundred and forty.

Bedford,
Oct. 31, 1769.

ABRAHAM DIXON,
THOMAS NOBLE, Cur. of Belford,
ABRAHAM LOGAN, ſurveyor.

candidate, he accordingly received the premium of fifty pounds offered by the Society for the greateſt quantity of land ſown in the ſpring of 1769.

* This product being forty-two thouſand one hundred and forty ſheaves, may be computed to be, in the proportion of nearly three quarters, four buſhels of grain, to each acre, allowing half a peck to each ſheaf; which has been deemed the neareſt average proportion, conſidering the difference in the bulk of ſheaves made by reapers of different countries.

Beſides Mr. Steward, there were four other candidates for the premiums of fifty pounds, viz.

	acres.	roods.	perches.	ſheaves.
Mr. Carr	70	3	35	14,646
Mr. Pyke	55	1	25	30,940
Mr. Reynolds	54	1	26	7,820
Mr. Radley	52	0	00	12,480

Mr.

Mr. *Carr*'s certificate of wheat ſown in the ſpring, 1769,

THIS is to certify, that worthy body of gentlemen, who conſtitute the Society for the Encouragement of Arts, &c.*

That John Carr of Great Maſſingham, in the county of Norfolk, farmer, did ſow with wheat this laſt ſpring ſeventy acres, three roods, and thirty-five perches, as by ſchedule, from Lady Leiceſter's map, hereto annexed, to whom the farm belongs, between the 10th February and 5th April, 1769, old ſtyle, broad-caſt above furrow, upon clover of one year's lying, and fed off.—The piece No. 1 mucked: as was No. 3. No. 2 was not: neither was the difference of the crop adequate to the mucking.

The ſheaves were numbered in every piece. But I am ſatisfied, that cannot let you into any light for aſcertaining the true quantity thereof: which, I preſume, is, what you mean by requiring an account of them: the corn being reaped by Engliſh, Scotch, and Iriſhmen, who greatly vary in the bigneſs of their ſheaves.—However, I collected four, as near an average as I could;

* Mr. Carr's certificate is inſerted at large, as being introductory to the letter on ſpring-ſown wheat, which follows it.

and

and threſhed them out, in order to give you all the ſatisfaction in my power. They produced two pecks, and one pint. We general eſtimately by the load from five to ſix or ſeven coombs per load: as in goodneſs, or badneſs of the ſeaſon.—I threſhed out two loads of white-wheat, winter-ſown; and it produced ſeven quarters, one coomb, and three buſhels. I do not admit the ſpring-wheat equal to that, nor much inferior. If any other matter or thing be wanting, I ſhall be very ready to give all the ſatisfaction in my power, whether intitled to your premium, or not. My calculation below is for half a peck to each ſheaf.

We, whoſe names are hereunto ſubſcribed do certify this to be true: having taken a perſon to view them before reaped: as witneſs to the ſchedule.

No. 1.

	A.	R.	P.		No. Sheaves.	Quantity.		Lasts.	Bo.	Br.
No. 1.	20	3	22	Pit whole Lands -	4,212	65.1	bo. equal to	6	5	2.2
No. 2.	20	0	10	Weafingham Cloſe -	3,610	56	ditto	5	8	0.1
No. 3.	30	0	3	Monks Breck -	6,824	106.1	ditto	10	3	1.0
Acres	70	3	35 a ½ peck.	Sheaves each ſb.	14,646	228 qrs.	Laſts	21	16	3.3

Numb. 1. produced twenty-four harveſt-loads. Numb. 2. twenty-two loads. Numb. 3. forty-one loads.

Signed this 11th day of Oct. 1769.

ROBERT MAYES, Great Maſſingham:
EDW. RUST, Little Maſſingham.
SAMUEL STANDFORD, ditto.
THOMAS BIGG, Gent. ditto.
JOHN GARDNER, Rector of Gr. Maſſ.

GENTLEMEN,

AS I think I have not been ſo explicit to you in the quality of the wheat ſown in the ſpring, as well as its vegetation, in my certificate, it makes me trouble you with this. If it be worthy of the gentlemen's notice, I ſhall be glad; if not, I hope they will candidly look over what ſeems to them inſignificant in what has been my obſervation in upwards of forty years practice. From their generous ſubſcriptions, it ſeems to be their intent (by premiums) to promote an inquiry into the knowledge of agriculture for a public utility.

For a ſpecimen of the quality of the wheat by my certificate, I refer you to ſamples as per bearer. One of the firſt was well reaped and got in: the other had ſome wet, as may be judged by the appearance.

Of

Of the beſt I meaſured one buſhel (Winchester-meaſure) which weighed ſixty-five pounds: and was, I think, very good; though I much doubt whether wheat ſown in the ſpring would be ſo in all ſeaſons. This was an uncommon one, in my opinion, for the following reaſons. The corn came up in good time, and promiſed well: but, before it was all ſown, the weather became extremely wet, and cold, with ſome froſt and ſevere winds at E. N. E. and the wind principally continued in that quarter till the firſt of May, when I verily believed, I muſt have been obliged to have plowed it all up again. As it had loſt all his verdure. What could be ſeen was of a dead blue hue, and ſeemed as if all vegetation ceaſed for ſome time; but upon a diligent, and conſtant examination of the roots, I found them alive; which ſhewed, that nature would not be idle, for they were grown ſtrong and vigorous, and largely expanded. The weather then ſetting milder, it was curious to ſee what efforts the plants made. In fourteen days, they covered the whole field, with ſome three, ſome four, ſome five, ſome ſix, and ſome ſeven ſhoots from the roots of one grain of the wheat: and all were bold and vigorous. The corn never met with one check more to the reaping. The ſtraw was of a fine light yellow: which always indicates corn in a good

good ſtate of health: as the roots are then able to furniſh it with materials enough for maturation. It is my humble opinion, from the inclemency of the ſeaſon it derived its quality: for, had the weather been temperately mild the whole ſpring, a quick vegetation would, and always will, far want of the roots being earlier expanded, bring on a mildew; and be the ruin of the ſpring-wheat.—The only remedy I can adviſe for that evil is, to feed the corn down cloſe to the ground, with a large number of ſheep (becauſe it muſt not be long in doing). This method I deſigned to have purſued, if mine had appeared to want it, in order to have given the roots time for expanſion, when I think they would have been more able to perform thoſe offices nature required. The cauſe, I have ever yet met with, from forty-one years experience, which is principally concerned in, or productive of the mill-dew, is, the dew's deſtroying the corn when in the milk. From the time of ſowing the grain there is no certain period for its coming up: but, from the weather quickening and fecundating the flour into action to perforate its ſkin, and begin its tranſmutation into a milky matter, which is the only ſupport for the tender ſhoots, till they are able to attract aſſiſtance from the mother-earth, and begin the vegetation: and

and which, if they are drawn up too quick; they rob the root too much, and render it incapable of furniſhing a ſufficient ſupport for what it had produced.—Therefore, the juices rather ſtagnate in the ſtems for want of a proper ſupply from the roots to force them through the veſſels of the ſtalk.—There are three knots in every ſtem of ſtraw. The firſt is the largeſt, being neareſt the earth: The ſecond is ſomewhat longer, but ſmaller: The third, and laſt, that part of the ſtem next the ear, is longeſt and ſmalleſt up to the ear. Theſe knots I cannot help calling valves: as, I think, Providence could have no other deſign for forming them, than to unburden the ſtems from ſo hard a taſk, as muſt conſequently accrue, to force ſo great a weight alternately up to the ear. Theſe valves I think of great uſe to the ſtem, as well as the ear. The groſſer parts, for what it has fabricated; the other finer juices for compounding that matter to the ear, which overloaded with rain, or conſtant heavy dews, impregnate with its own ſalubrious juices, corrode and ſower that milk which nature deſigned for its nouriſhment, conſequently bring on its deſtruction.—I have ſeen many inſtances of wheat being mill-dewed round by the hedge-rows; though the interior parts of the field have not been at all affected, by the ſun's and wind's drying, and otherwiſe diſperſing

thoſe

thoſe obnoxious qualities, which otherwiſe muſt have produced the ſame effect. It is ſurpriſing to ſee, what efforts nature makes for unburthening herſelf from this diſtemper, when ſhe labours under it. All the tubes are then fit to burſt with thoſe crude juices, which ſhe is conſtantly throwing out through the pores of the ſkin, in a fine white powder, from one end of the ſtem to the other, which is eaſily wiped off by the finger, when the colour of the ſkin under it will be found of a purple hue, inſtead of its native green; and the ſtraw, when thoſe juices are abſorbed, is, if I may be allowed the expreſſion, in a mortified ſtate, and very rotten: which conſequently leaves the fruit imperfect.

If you ſhould find any thing within worth your notice, I ſhall think my time well beſtowed: and am, upon all occaſions,

Your moſt obedient

and humble ſervant,

Anno 1773.

JOHN CARR.

Mr. *Steward*'s certificate* of his ſowing wheat in the ſpring, 1771.

WE, whoſe names are underwritten, do certify, that Mr. John Steward of Roſs, in the

* This certificate was ſent to the Society in claim of their premium of fifty pounds for ſowing wheat in the ſpring 1771, and the number of acres being far ſuperior to that of any other candidate, the premium was adjudged to Mr. Steward.

There were five other candidates, viz.—Mr. Wrout, who ſowed, in February, one hundred and nine acres and three perches wheat; which, being reaped in the middle of Auguſt, produced two thouſand nine hundred and thirty-ſix buſhels; or twenty-ſix buſhels, ſeven gallons, and three pints per acre: though when laſt ſown with wheat in autumn, it produced only twenty-three buſhels per acre: the weight was fifty-nine pounds per buſhel.

Mr. Earl, who ſowed in January and March fifty-two acres fourteen perches: which being harveſted, about three weeks later than uſual, produced ſome two, ſome three, and ſome four quarters per acre, which is nearly the ſame as this land produced when ſown in autumn: weight ſixty-one pounds per buſhel.

Rev. Mr. Allen, who ſowed, between the 10th of February, and the 5th of March, twenty-five acres: which, being reaped between the 30th of Auguſt and 10th of September, produced five hundred and five buſhels, or nearly twenty buſhels, one gallon, and one pint, per acre: weight fifty-five pounds per buſhel; which was as good a crop as any in the neighbourhood ſown in autumn.

Mr. Tadman, who ſowed, in February, nine acres; which, being harveſted the firſt in the pariſh, produced twenty-five quarters, and two buſhels; or nearly two quarters ſix buſhels three pecks and four pints per acre: weight forty-nine pounds per buſhel; the buſhel was eight pecks and a half.

the pariſh of Belford, and county of Durham, farmer, did, after the 1ſt day of February, 1771, cultivate in quantity *one hundred and fifty* acres and twenty-ſix perches of land, with wheat.—The quality of the ſaid land, being a ſtrong reddiſh clay, and of a dry nature, free from ſprings. The time of ſowing was from the 12th of March, 1771, to the 8th of April following: when the whole was ſown; being in all, four hundred and forty-two, Wincheſter buſhels of wheat ſown.

And we do, alſo, certify, that the time of reaping the ſaid crop was from the 29th of Auguſt, 1771, to the 22d of September following: when the whole was reaped.—That the quantity produced, per acre, was twenty-two Wincheſter buſhels, weighing four ſtones and three pounds per buſhel, at fourteen pounds to the ſtone.—And we do, alſo, certify, that the uſual average-produce of the ſame land, when ſown with wheat in autumn, was eighteen buſhels and no more:—and that the uſual time of reaping ſuch autumnal ſowing was from about the 20th of Auguſt, to the 14th of Sep-

Mr. Green, who ſowed, in February, eight acres and a half: which, being reaped on the 2d and 3d of September, produced twenty-five buſhels and a half, per acre: weighing ſixty-five pounds and a half, per buſhel.

tember; when the whole was uſually reaped.

ABRAHAM DIXON.
THO. NOBLE, Curate of Belford.
ABRAHAM LOGAN, Surveyor.

To Mr. *Samuel More*, Secretary to the Society for the Encouragement of Arts, Manufactures, and Commerce.

SIR,

IF you will take the trouble of laying the incloſed particular, relating to a trial made on ſpring-ſown wheat, before the Society, you will greatly oblige,

Sir,

Your moſt humble ſervant,

JOS. SHAW.

MY LORDS, AND GENTLEMEN,

YOU having ſignified by the publication of your premiums, the laſt year, a deſire to have ſome further trials made upon the advantages ariſing from the ſowing of wheat in ſpring, I beg leave, to lay before you the particulars of a ſmall trial I made this ſpring.

On

On the 18th of March, 1771, after once plowing of four acres of land of a light haſel-mould, which had been turneped, and eat off with ſheep, I ſowed the ſame with red Lammas-wheat; allowing nine buſhels of ſeed to the four acres.—I began to reap the ſame on the ſecond of September, which was as ſoon, or ſooner, than ſome of that which had been ſown the Michaelmas before.—I had, upon the four acres, one hundred and ninety-eight ſhocks of yielding good wheat, which is now threſhed out; and produced fifteen quarters two buſhels of grain; and which, when carried to market, fetched the top-price. The weight of a buſhel of the ſeed was ſixty-eight pounds.—I would obſerve, I ſhould have had near a quarter of corn more, upon this piece of ground, had it not been for the injury that was done to it by a neighbour's hogs; which, by frequently getting into the ſame, deſtroyed that quantity.—I had an acre of the ſame ſoil, and adjoining to the four acres, which was ſown the Michaelmas before, upon which I had but thirty-three ſhocks; and which, when threſhed, produced three quarters. The fifteen quarters and two buſhels are excluſive of the tythe which was taken out of the field. This I think abundantly ſhows, the great utility ariſing from ſpring-ſown

wheat; and how greatly the public are indebted to your honourable Society, for this, among many other valuable diſcoveries, that have been made in agriculture, through the great encouragement you have been pleaſed to give it.

I have the honour to be,

Your moſt obedient,

and humble ſervant,

Epſom,
31ſt Dec. 1771.

Jos. SHAW,

ARTICLE IV.

Account of Trials at large, made by Mr. TADMAN, *to determine* the comparative Advantages of the Drill and Broad-caſt Methods of Culture of Wheat and Lucerne: *and of an Experiment made by Mr.* REBECCA, to diſcover what Increaſe may be obtained from a Grain of Wheat, in one Year; from repeated Tranſplantations; *communicated to the* Society for the Encouragement of Arts, Manufactures, and Commerce, *and inſerted at their Requeſt.*

To *Robert Doſſie*, Eſq.

SIR,

THE Society for the Encouragement of Arts, Manufactures and Commerce, have directed me to deliver to you Mr. *Tadman*'s account of the culture of wheat; and Mr. *Rebecca*'s experiment on the increaſe of a grain of wheat, by repeated tranſplantations, in order to their being inſerted in the Memoirs of Agriculture, if you think proper.

I am, Sir,

Your very humble ſervant,

SAMUEL MORE, ſec.

To the honourable and laudable Society for the Encouragement of Arts, Manufactures, and Commerce.

GENTLEMEN,

HAVING been honoured with your premium for the culture of turneps amongſt beans, for which I return you thanks, I find you are deſirous of being informed of the beſt method to cultivate wheat, either by drills, or broad-caſt, both of which I am well acquainted with: having experienced them many times upon all ſorts of land. But the greateſt experiment was in 1752 and 1753. In the year 1752, I had twenty-two acres of bean-gratten dunged for the beans about forty loads per acre, which I managed as follows.

I firſt plowed it; after which I ſowed my wheat in this manner. Every other rod in breadth was in the broad-caſt way: the other was in drills. In the ſpring I horſe-hoed the drills, and harrowed it; as I did, alſo, that, which was ſown in the broad-caſt way. Both of them ſeemed to make a good appearance. When harveſt came, I directed the reapers to cut each rod ſeparate; and to make the ſheaves as nearly of the ſame ſize as poſſible. By this I found a great

a great deficiency in the drilled wheat: not having near ſo many ſhocks. This was tried on a ſandy loam ſoil.

The next year, I had a field of twenty-three acres, adjoining to the other, managed in the ſame manner: I found the ſame deficiency: and I think it very eaſy to be accounted for. In the ſpring of the year, when the wheat begins to riſe from the ground, the land being very clean by the hoeing, and the ground very fine by ſo doing, the ſhowers, that are very frequent in March, cauſe the fine mould to riſe on the tender part of the wheat: which, when it happens, prevents it from growing any farther.—It is a very good way, to ſow clover in wheat in February. I never could find, that drilling any thing but beans, peaſe, and tares, would produce near ſo good a crop: neither will they do any way ſo well, as in drills: by which means the land is kept clean; and makes a good ſeaſon for wheat.

Now, in regard to lucerne, ſainfoin, &c. being put in drills, it is in a manner the ſame as in the caſe of wheat. I have a deal of lucerne: part of it in drills; which I have endeavoured to keep clean by hand-hoeing. But, after a hard rain, ſeeing my horſes would not eat it, I found upon inſpection, the earth was ſo much waſhed

into it *, that it was a good reaſon for ſowing the other part broad-caſt way. I immediately cut off that they eat upon: and I then ſowed the land over in broad-caſt, and raked it with a hand-rake. I have not found any thing of the ſame kind happen ever ſince.

If this information may be of any utility, I ſhall be happy in having given it: as I may be ſuppoſed to know ſomething of the farming buſineſs: having been in it near forty years. I began at firſt harrow-boy: from that, I went through every other part of plowing, ſowing, &c. and before I was twenty-four years of age, I paid eighteen hundred pounds per year rent.

I have another thing to offer to this Society, which I can explain. It is that three crops may grow in the ſame year, with the ſame culture, and expence, as one crop; and that they will not interfere with one another: but, quite otherwiſe, wherever one is good, the other two will be ſo likewiſe. I hold at this time about two thou-

* This inconvenience attending drilled lucerne is peculiar to Mr. Tadman's, and ſuch other very ſandy land. For many inſtances can be produced of drilled lucerne, now growing, which is entirely free from it.

ſand

ſand two hundred acres of arable, meadow, and paſture-land.

I am, with the utmoſt deference and reſpect,

Your honour's moſt obedient,

and humble ſervant,

Higham,
19th Dec. 1772.

WM. TADMAN.

To Mr. *Sheild*'s nurſeryman, at Lambeth, Surry.

SIR,

IF the following ſingle experiment, proceſs, and product of a ſingle grain of wheat, will give you any pleaſure, and you ſhall think it worth laying before the Society for the Encouragement of Arts, and particularly Agriculture, I ſhall think myſelf amply paid for the pains I took in making the experiment. The increaſe appears aſtoniſhing to me: I have, therefore, communicated it to you, though there may appear nothing wonderful in it, when read before your learned body*: and I may be ſmiled

* Mr. Miller made the ſame trial at Cambridge, ſome years ago, and with very little difference in the manner. The reſult was ſimilar, as to the produce; and he communicated

ſmiled at, for my rural ſimplicity, and ignorance. As, poſſibly, there may be many more wonderful inſtances of vegetable increaſe, ſhould that be the caſe, you will, in a ſingular manner, oblige me by communicating them to me; who am fond of ſuch ſubjects of admiration.

I am with great eſteem, Sir,

Your moſt obedient,

and humble ſervant,

Amerſham, Bucks,
12th Jan. 1773.

WM. REBECCA.

municated an account of the experiment to the Royal Society, who publiſhed it in their Memoirs. Others have repeated the experiment with a correſpondent ſucceſs.—The making more generally known, however, what rapid increaſe, corn, and other herbs of the gramineous tribe, admit of by tranſplantation and diviſion, from the property of the quick production of off-ſets from their roots, may at preſent, be of utility: when attempts are making to improve the culture of wheat, on that principle: to which the knowledge of this prodigious multiplication of the plants, by diviſion of the roots, gave riſe. The Society have in this view offered a premium to encourage trials of the application of tranſplantation, to practiſe in particular caſes where it may be advantageous.

The

The produce of a ſingle grain of wheat, propagated in the garden of the Rev. Dr. *Drake*, rector of Amerſham, Bucks, by *Wm. Rebecca*, gardener.

ON the firſt day of Auguſt, 1771, I ſowed, or rather ſet, a *ſingle* grain of the red wheat: and, in the latter end of September, when the plant had tillered, I took it up; and ſlipped or divided it into four ſets, or ſlips.—Thoſe four ſets I planted; and they grew, and tillered as well as the firſt. In the end of November I took them up a ſecond time; and made thirty-ſix plants, or ſets. Theſe, I again planted, which grew till March, 1772: in which month, I, a third time, took up my plants, and divided them into two hundred and fifty-ſix plants, or ſets. For the remaining part of the ſummer, till the month of Auguſt, they had nothing done to them, except hoeing the ground clean from weeds, till the corn was ripe. When it was gathered, I had the ears counted, or numbered, and they were three thouſand five hundred and eleven: a great part of which proved as good grain, as ever grew out of the earth. Many of the ears meaſured ſix inches in length: ſome were middling grain: and ſome were very light and thin. This was the reaſon, I did not number the grains: but there was better than half a buſhel

buſhel of corn in the whole produce of this one grain of wheat in one year.

Query, would not this practice (ſpring-planting) be of great uſe *, where the crops do miſs, by various accidents, incident to farming?

I can prove the above facts by the atteſtation of ſufficient witneſſes, if doubted.

* Mr. Rebecca is not ſingular in this opinion.—Though the tranſplanting wheat, as a general mode of culture, is not eaſily reducible to conſtant practice; yet in ſuch caſes, as he intimates, where conſiderable parts of land have failed after autumn-ſowing, it may be done with great convenience. Nor does there, after a very careful examination of the ſubject, appear any ſolid reaſon, why, in the ſeaſons when the autumn-culture of wheat has failed much, freſh land might not be planted with off-ſets of that grain, as well to private emolument, as public advantage. This practice is the more promiſing, becauſe the tranſplantation may be performed much later than the laſt made by Mr. Rebecca, even till the end of April, with the ſame certainty of ſucceſs: and land, which had borne turneps, cole-ſeed, or other plants for ſpring-food, even late in the ſeaſon, might be made to afford a large crop of wheat the ſame ſummer with great profit, when there was a proſpect of ſcarcity. The apprehenſion of the too high expence of labour has been made the great objection to this practice. But the introduction of the *ſetting* wheat inſtead of ſowing it, which is now done, in ſome places, on great quantities of land with very conſiderable profit, has ſet this matter in ſo clear a light, from large experience, that all difficulty on this ſcore muſt be given up, where thoſe facts are known. For the ſaving in the quantity of ſeed, when the corn is ſet, nearly pays for the difference of the expence of labour betwixt that method and ſowing: and this ſaving is ſtill much greater in the caſe of tranſplanting than in ſetting, though the expence of the labour differs but little.

AR-

ARTICLE V.

Mr. TADMAN's *Certificates, and Accounts of the Culture of Beans, with Turneps.—Account of the Culture of Parſnips, for feeding Cattle, by Mr.* BUDD :—*Account of the Culture and Preſervation in Winter of the Vegetables proper for feeding Hogs, by Mr.* REYNHOLDS :—*and Mr.* JESSARD's *Certificate of his cultivating the Turnep-rooted Cabbage, and Obſervations on its Utility.*

To *Robert Doſſie*, Eſq.

SIR,

THE Society for the Encouragement of Arts, Manufactures, and Commerce, have directed me to deliver to you Mr. *Tadman*'s certificates and accounts of the culture of beans, with turneps;—Mr. *Budd*'s account of the culture of parſnips;—Mr. *Reynholds*'s method of cultivating and preſerving plants for feeding hogs;—and Mr. *Jeſſard*'s certificate of cultivating the turnep-rooted cabbage; in order to their being inſerted in the Memoirs of Agriculture, if you think proper.

I am, Sir,

Your very humble ſervant,

SAMUEL MORE, ſec.

Mr. *Tadman*'s certificate of his ſowing beans with turneps, in 1771 *.

I William Tadman, of the pariſh of Higham, in the county of Kent, do hereby certify to the honourable and laudable Society of Arts, Manufactures, and Commerce, that I did, between the 1ſt day of May, 1771, and the laſt of July, 1771, ſow, or cauſe be ſown, fifty-four acres of turneps amongſt beans: the cultivation of which was as follows, viz.

The land was plowed between the 1ſt of December, 1770, and the laſt of January, 1771; the nature and ſoil were as follows.

* In 1769, the Society received from Mr. Chambers of Deal, an account of the diſcovery made by him of a method *of raiſing a crop of turneps, without the loſs of a crop of corn, or putting the land out of the regular courſe of tilth.*—It conſiſted in *ſowing turneps in the intervals of beans raiſed in drills.* The letters explaining the particulars of this experiment, are inſerted in the ſecond volume of this work: ſee page 354.—The matter appeared from the facts related by Mr. Chambers to be ſo promiſing of advantage, that, in order to have a full confirmation from further trials, the Society, in 1770, offered the premium of their gold and ſilver medals, for an account of the beſt ſet of experiments before November, 1772, made on this ſubject. The land for the gold being not leſs than five acres; for the ſilver, three acres. Mr. Tadman accordingly claimed the gold medal for the experiments ſpecified in this certificate; which being conformable to the terms of the advertiſement, it was adjudged to him.

Four

Four acres, a flat ſtiff clay, fed with ſheep, in February, and ſown with wheat.

Fourteen acres ſtrong ditto, upon a deſcent, aſpect to the weſt, fed in February, ſown with oats.

Eighteen acres ſtrong ditto, on a hill, aſpect to the ſouth, fed in March, ſown with oats.

Eighteen acres flat, wet loam, ſaved for ſeed; produced twenty-three quarters, four buſhels, one pottle, Wincheſter meaſure.

On all which, being fifty-four acres, was a good crop. Our manner of feeding is with hurdle gates.

In the February following, I drilled in my beans. As ſoon as they appeared in round leaf, I rolled them: after which, I harrowed them twice in a place, acroſs the drills: which not only gave freſh earth to the beans, but deſtroyed the ſmall weeds. —After lying ſome few days from the time of harrowing, I had the beans hand-hoed: and in about three or four days after, I horſe-hoed them; and threw ſome earth to the beans: which was done in order to ſtrengthen them; and deſtroyed the weeds. —In about a week after, I horſe-hoed them again; and threw up ſome more earth to them: which I think neceſſary to keep the beans upright.—

By this time, I thought the beans well ordered; and, about the 25th of May, I

proceeded to ſow my turneps, in the broad-caſt way.—The next beſt method is, by a machine.—The reaſon I think this not ſo good is, that if the drills are not equal, part of the land muſt be unſowed: which will not happen from a good ſeedſman in the broad-caſt way.—After ſowing the turneps, I horſe-hoed them with a harrow behind the hoe: which reverſes the earth, covers the ſeed, and deſtroys the ſmall weeds, that have ſprung up ſince the laſt hoeing.

In this ſtate they remained till after harveſt. If any ſmall weeds appeared, I put lambs in them; which are exceeding good weeders, without any expence. I often turn them into my turneps I make ſummer-fallow: as knowing they will not eat them till they come to perfection.

This ſame year I had thirty-ſix acres of much ſuperior land, dunged all over: ſome of which was ſown three times: and, in the whole, not more than ten acres fit to ſtand; and they were very backward.

Now

	£.	s.	d.
Now the rent of thirty-ſix acres of land ſtands me in - - -	36	0	0
Plowing five times, at ſeven ſhillings per acre each time - - -	63	10	0
Dunging with ſixty load per acre, at one ſhilling per load - - -	108	0	0
Harrowing twelve times, at four pence per time - - -	7	4	0
Rolling ſix times, at one ſhilling per time	10	16	0
Hoeing ten acres, at ſix ſhillings per acre	3	0	0
Sowing the different times, and ſeed -	5	16	0
	234	6	0
Deducting ten guineas for ten acres of turneps - " - .	10	10	0
Againſt the farmer	223	16	0

This is the common way of appraiſing, between one man's taking a farm, and another's leaving it.

Now, with reſpect to the fifty-four acres that were ſown in beans, the whole expence of them, more than muſt of neceſſity have been to them, is as follows:

	£.	s.	d.
Fifty-four acres ſowing, at four pence per acre	0	18	0
The ſeed fifty-four acres, at one quart on an acre, price one pound per buſhel -	1	3	9
Whole expence	2	1	9

	£.	s.	d.
Eighteen acres ſeed produced twenty-three quarters four buſhels and one pottle, at one pound one ſhilling per buſhel -	197	9	3
Thirty-ſix acres fed with ſheep, at one pound one ſhilling per acre - -	37	16	0
	235	5	3
Deducted for cutting, threſhing, expences of ſowing, &c. - -	46	6	9
In favour of the farmer	188	18	6

By this is plainly ſeen the utility of ſowing turneps amongſt beans. They are often ſown ſo, but at very improper times, and the regard not paid to them which ought to be, from the bad appearance they make, when the beans are firſt taken away. If I am explicit enough to be underſtood in this affair, I ſhall be very happy; and I remain, with the utmoſt deference, and reſpect,

Your honours moſt obedient,
and humble ſervant,
WM. TADMAN.

J. YOUDE, Vicar.
The mark of
WM. × LAST, Churchwarden.
RICHD. BRENCHLY.
JAMES BROMLEY.
THOS. FRENCH.

Cer-

Certificate of Mr. *William Tadman*, of his ſowing turneps with beans, in 1773*.

I William Tadman, of the pariſh of Higham, in the county of Kent, do hereby certify to the honourable, and laudable Society for the Encouragement of Arts, Manufactures, and Commerce; that I did, between the 8th of May, 1773, and 29th of July, 1773, ſow, or cauſe to be ſown, ſeventy-four acres of turneps among beans. The cultivation of which was as follows.

Firſt the ground was plowed, between the firſt of December, 1772, and the 29th of January, 1773; and was moſtly wheat-grattings. — The February following, I drilled-in with beans: and as ſoon as the beans appeared in round leaf, I rolled them. After which I harrowed them twice in a place. This at the ſame time, deſtroys the ſmall weeds; and gives freſh earth to the beans.—After lying in this manner a few days, they were hand-hoed: and ſoon after

* The ſubject and occaſion of this kind of certificate has been before explained, in note *, page 96, on the former certificate for 1771, by which Mr. Tadman obtained the premium of the gold medal.—The Society having, in 1771, extended the ſame premiums to the years 1772, and 1773, Mr. Tadman ſent this certificate in claim of the gold medal, for the experiments made by him in 1773: and it was accordingly adjudged to him.

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this, they were horſe-hoed; and ſome earth thrown up to them, in order to prevent the weeds coming again.—In about a week after, I horſe-hoed them again, and a little more earth was thrown on them: which, as they grow in height, is required, in order to keep them upright.—By this time, I thought the beans were well ſecured: I then proceeded to ſowing my turneps in the broad-caſt way: which, by experience, I find much the beſt: having tried the drill, &c. But the drill is not ſo good, by reaſon, if they are not equal, there will be a miſs; which will not happen with a good ſeedſman after ſowing turneps in broad-caſt. I horſe-hoed; my beans again, with a ſmall harrow, behind the hoe: which deſtroys the ſmall weeds, lets in the earth, and heels the ſeeds. In this ſituation, they remain till the beans are carried: and if I find there are any ſmall weeds, I turn in a few lambs. For they are exceeding good weeders; and will not eat the turneps, while in this ſtate: and I often turn them into my ſummer-fallow turneps.—I had not one ſingle acre miſs of my turneps with the beans: and all very good: but, on the contrary, thoſe in the fallows miſſed very much.—In January, 1774, I began to feed the turneps off with ſheep. I kept the ſheep ſeparate: and thoſe ſheep in the beans

beans and turneps, far exceeded thoſe in the fallows: the latter not being ſo ſweet, nor ſo good as the former *.

Anſwer to a letter to Mr. Tadman, deſiring a more explicit account of ſome particulars, in his certificate.

To Mr. *Samuel More*, Secretary to the Society for the Encouragement of Arts, Manufactures, and Commerce.

Higham, Nov. 27, 1774.

SIR,

I have endeavoured to give you the beſt account I am able of the turneps with beans. The number of ſheep fed, were one thouſand five hundred ſtore-ſheep; and five hundred for fatting: which I put in at St. Michael, and took out at Chriſtmas, or very near. The value of the turneps eaten was, I think, twenty ſhillings per acre; and the value of the turneps for ſeed worth one hundred and eighty-four pounds. The quantity of beans I grew per acre, was five quarters: which was very good, and

* The Society, not thinking the value of the crops ſtated with ſufficient clearneſs in this general account of them, directed their ſecretary to write to Mr. Tadman for a more diſtinct explanation of the particulars relating to them; to which the following ſatisfactory anſwer was given.

the ground much improved by the ſheep, —Ten acres I ſowed with oats, and the reſt with wheat.

I remain, Sir,

Your moſt humble ſervant,

WILLIAM TADMAN.

P. S. I hope this will be a ſatisfactory account: as I am very ill with the gout.

Mr. *Budd*'s Account of the Culture of Parſneps, for feeding Cattle.

GENTLEMEN,

BEING upon a viſit to a friend in the iſland of Guernſey, in the year 1767, I made ſome obſervations on the culture of parſneps: having remarked the great utility they were of to the farmers, in that iſland, in fattening cattle: as by preſerving them till the lateſt part of the winter, they prove of the greateſt uſe to dairy-cows.

I, therefore, purchaſed ſome of their beſt ſeed, I could get; and determined, upon my return to England, to make ſome trial of them by way of experiment: but, on my return, I found it too late, that year, to ſow my ſeed; and was obliged to poſtpone it till the year following.

On

On the 12th February, 1768, being the proper time for ſowing parſneps, I ſowed one acre on haſel-mould ſoil, the mould lying about three feet above the chalk, rather ſtony, the ſtones moſtly ſmall black flints.—The ground being after turneps, and clean, I double plowed it; the firſt time, I juſt broke the earth about three inches; the next time eleven or twelve inches: the land turning up juſt the ſame under, as on the top.—I harrowed the ground once over before ſowing; and immediately after ſowed the parſneps; and harrowed the ground once over again after the ſeed: which made it very fine.—The ſeed laid in the ground about ſix weeks; when it came up: and, as ſoon as I judged the plants of a proper ſize to take the hoe, which was in about ſix weeks, I hoed them once over, finding the weeds grew very faſt, leaving the plants about four inches clear one from the other. The expence of hoeing was thirteen ſhillings and four pence.—The hoe, made uſe of for hoeing them, was about four inches wide. In about three weeks after, I hoed them a ſecond time; which coſt me ſix ſhillings and eight pence: finding the freſh earth, when moved up to the plant, to make them grow much faſter than before.—They remained till the beginning of November, when

when I began to dig them up, which coſt me three ſhillings and four pence per load. —I had on one acre fifteen waggon-loads; meaſuring forty buſhels to the load: which made the expence of digging-up amount to two pounds ten ſhillings. I firſt attempted to dig them up with a ſpade: but found it cut, and bruiſed the roots: which obliged me to try another tool, that is called, with us, a hop-ſpud: having three ſpanes to it about twelve or thirteen inches long, each; and with care breaks the ground very true: which, I find to be of as much ſervice to the land, as twice ploughing.— I now proceed to the next expence, the drawing them home; which coſt me one ſhilling per load.—I put them in a houſe dirty; the ſame as when drawn out of the field, and covered them with peaſe-ſtraw: which preſerved that part of them, I did not want for immediate uſe, all the winter as hard and firm, as the firſt day they were dug. After having cleared the parſneps off the ground, about the middle of November, I ſowed it with wheat, together with the remaining part of the field; being ſeven acres, the ground all of equal ſoil and goodneſs: which ſeven acres I dreſſed well. I ſowed the parſnep-ground, alſo, but without any dreſſing: both, the parſnep-ground, and the other, being plowed only once.— The difference of the crop of wheat, when threſhed,

threſhed, was as follows, viz. In the acre of parſnep-land, four quarters; on the ſeven acres, only three quarters and a half per acre: which is a proof of its being a good ſeaſon or tilth for wheat.

Having given you a particular account of the manner, in which I cultivated my parſneps, I will now proceed to tell you the uſe I made of them.—In the firſt place, I put up ſixteen hogs a fattening upon them. The method I took in giving them to the hogs, was throwing the parſneps on the ground whole. This I continued for about a month: when, finding my hogs grow heavy, I obſerved, they did not go on ſo well with them as at firſt. Upon this, I boiled the parſneps, and made waſh of them: thickening the waſh with half a buſhel of barley-meal, every day. I gave it them in a trough: and continued this method for two months, when I killed them; and found them to be very good meat; weighing from twenty-eight to thirty-three ſtone per hog: one of them, being very large, weighed fifty-eight ſtone. The neat value of my hogs, when killed, amounted to fifty-two pounds ſeventeen ſhillings and four pence. The whole expence of my barley-meal, with which I thickened the waſh, amounted to three pounds eighteen ſhillings and nine pence. —Of the firing to boil them, at ſix pence per

per day, one pound ten ſhillings.—Of a boy to look after them for three months, at ſix pence per day, two pounds five ſhillings: which ſums, added to the expences attending the parſneps, prime coſt of the hogs, &c. amounts, in the whole, to thirty-five pounds: ſo that my profit, upon this article only, is ſeventeen pounds ſixteen ſhillings and eight pence; which remains to be carried to the account of the parſneps. After my hogs were killed, I kept four dairy cows upon the remainder of the parſneps for three months: which, at eighteen pence per week, amounted to three pounds twelve ſhillings; and this ſum, added to the ſeventeen pounds ſixteen ſhillings and ſeven pence before mentioned, makes the neat profit, on the one acre of parſneps, to be twenty-one pounds eight ſhillings and ſeven pence.

I muſt obſerve, that, giving my dairy-cows the parſneps, anſwered my purpoſe greatly, by increaſing their milk; and making the butter much richer, and finer than turneps, or carrots: which I had given them long before.—The manner, in which I gave the parſnips, was cutting them in pieces.

I come now to the year 1769: when I ſowed two acres out of a clover-lay, upon a different ſoil from that of the year before,

fore, by way of experiment. This ſoil was rather a lighter haſel-mould, and more inclinable to ſand.—The expence per acre was much the ſame as before. I had not now above thirteen loads upon an acre: which, you will obſerve, is not ſo good a crop as laſt year. This, I attribute to the difference of the ſoil: as I am of opinion, this is not ſo good for parſneps as the right haſel-mould land.

Finding the parſnips agree with my hogs, and cows, ſo well laſt year, I now determined to give them to my horſes: and having five, that were making up for ſale, I begun with them, by giving them a very few the firſt week. I obſerved then, they agreed with them extremely well: and I therefore gave them a larger quantity, which made them thrive very faſt; and determined me to continue giving them the parſneps, which ſaved me a great deal of hay: as I found, they had occaſion for very little of it. I kept them in this manner for ten weeks; when I ſent them to Mr. Bever's repoſitory, where they were ſold for forty guineas each horſe. The manner, in which I gave them the parſneps was, cutting them in ſmall pieces, and throwing them in the manger.—I calculate the expence, half a guinea per week for the parſnips for each horſe: which amounts to twenty-

twenty-ſix pounds five ſhillings, to be carried to the account of the parſneps for this year.

At the ſame time, I began fattening an ox, which coſt me four pounds ten ſhillings from the plough. He was thirteen weeks a fattening; and eat nothing but parſneps the whole time. I then ſold him to Job Spratley, a butcher, at Guildford, for two ſhillings and eight pence per ſtone; weighing one hundred and two ſtone, and ſix pounds: which amounted to thirteen pounds fourteen ſhillings and four pence. Excluſive of the above, he had within him twenty-two ſtone, ſix pounds of looſe fat: which was more than ever was known to be taken out of a bullock of that weight, in the town of Guildford. and it was remarked, by many, that finer beef never was eaten. I mention theſe particulars, in order to ſhew the great uſe of parſneps:—as I am convinced, by experience, they are preferable to carrots, or turneps. But to proceed on, in my account, the profit upon this bullock amounted to nine pounds four ſhillings and four pence: which I, alſo carry to the account of the parſneps.

The remainder of my parſneps I gave to ſeven dairy-cows, eleven weeks, at one ſhilling and ſix pence per week each: which amounts to five pounds fifteen ſhillings and

ſix

ſix pence; ſo that the neat profit (after deducting ſix pounds twelve ſhillings per acre, for the neceſſary expences attending the parſneps, as per the calculation for laſt year) amounts to twenty-eight pounds and ten pence, beſides a great many of the parſneps, that I gave occaſionally to my ſtore-hogs, and cattle; which I valued at three pounds ten ſhillings.

The above two acres, I ſowed with wheat after once plowing; which made it an exceeding good ſeaſon; and produced about ſeven ſacks upon an acre,

In the year 1770, I ſowed four acres and a half of parſneps, upon a ſtronger hazel-mould land than the two former years.—I have already dug up three acres: and, by the quantity of parſneps taken up, my crop appears much larger than in the former years: which convinces me, the ſoil, on which I cultivated them this year, is better. I am now keeping nine horſes, and my dairy-cows, upon them: and I have been offered three pounds per load, for ſeven loads.

As my crop is better this year, my profit will conſequently be greater: which leads me to obſerve, that the profits on parſneps is not only larger, but the root itſelf greatly ſuperior to carrots, or turneps, particularly for dairy-cows, and in fattening beaſts, &c.

I am

I am of the opinion, the beſt ſeaſon for them is after turneps.—The quantity of ſeed to be ſown upon an acre is five pounds.

I am, Gentlemen,

Your moſt obedient ſervant,

Wandborow, near Guildford, Surry,
31ſt January, 1771.

WM. BUDD.

To the Society for the Encouragement of Arts, Manufactures, and Commerce, London.

A ſet of Experiments, addreſſed to the Honourable Society of Arts, &c. aſſembled in London; by Mr. *Reynolds*.

MY LORDS, AND GENTLEMEN,

IN the year 1768, by your encouragement, I turned my thoughts toward making further trials on herbs, and roots; in order to find out, which might turn out moſt advantageous to the huſbandman.

For this end, I made a good fallow of ſixteen acres (land very ſimilar) for this purpoſe, and cultivated the ſame as follows.

Tillage. I gave the land two ridge, and three clean plowings, five in all, ten inches deep, before the ground was either cropped, or planted.—

Brick-

Soil. Brick-earth chiefly; and deep loam mixed with flints; which I divided in the following manner.

For Herbs,	*and Roots*
Four acres for cabbages.—Four acres for bore-cole, and Scotch kale, being two for each.	Four acres for turneps. Four acres for turnep-rooted cabbage. This part had a large mixture of flint-gravel, but the ſame ſoil.

Culture of Cabbages.

Sown the beginning of March, 1769: that of the common white cabbage, the laſt ten days in June. Seeds.

Three feet by two in rows. The weather being favourable, very few failed: and ſuch as did, were ſoon filled up. Planted.

Hand-hoed firſt round the plants: twice horſe-hoed; earthing the plants up the two laſt hoeings.

Part good, part bad. Grubs and caterpillars deſtroyed one-fifth at leaſt of the crop: and this evil of the plants being devoured by caterpillars, has frequently happened to me in the culture of theſe herbs. I find ſuch as eſcaped the vermin weighed about five pounds each, upon a common average: ſo that I judge, the whole remains of the product to be about twelve tons per acre, for ſpending eatables. Succeſs.

Folded off in ſpending. This crop kept three hundred and twelve ſheep twelve days, in February and March, 1770: allowing a little trefoil-ſtraw at night. Obſerve they feed well. All cattle are fond of them; yet, nevertheleſs, being liable to many accidents, we ought not to place our whole dependence herein. I ſay this, that gentlemen may not be too ſanguine in raiſing of cabbages.—But, perhaps, I am going out of my province, in dictating. However be aſſured, I mean well for public good.

Turnep-culture (four acres.)

We ſtruck this land with a double drill-plough, in equal-diſtant furrows, twenty inches apart, and ſix in depth.

Seeds. Sown 15th June, 1769, mixed with a little raddiſh; allowing one quart per acre in broad-caſt; harrowing and rolling as cuſtomary.—

Hoeing. Cut out the plants to one foot diſtance, not leſs in the rows:—horſe-hoed twice with an inſtrument having three plates, or hoes, as weeds advanced.

Succeſs. A good growth, upwards of thirty tons per acre, in November, 1769: but the ſevere froſt, and rains, in December, rotted great numbers.

So

So that I believe, the crop was reduced to twenty-four or twenty-five tons at moſt.—Theſe maintained my flock (being two hundred and twelve ſheep) one hundred and twenty-one days; and were ſpent in January and February, 1770, giving a little peaſe-ſtraw. Product and feeding.

I obſerved, the ſheep looked but indifferently: weather cold and wet. Folded in.

Culture of turnep-rooted cabbage (four acres,) three different ways.

Sown the 26th April, 1769, ſufficient for the whole land, on one acre in drills, two feet apart.—This acre raiſed plants enough for its own uſe, and ſupplied two acres more (three acres in all) with what was requiſite. Theſe two acres, I am now ſpeaking of, were planted out the laſt week in June, 1769: diſtance two feet by twenty inches:—hand and horſe-hoed duly. Seeds.

The third and laſt acre was ſown in broad-caſt: allowing one pound of ſeed for the ſame. This project afforded me what was ſo ſought for; namely the difference between planting, drilling, and ſowing: which you will hear by and by, after giving an account of the huſbandry-work.—The plants on the drilled part were cut out at a foot or more in May; and horſe-hoed immediately after: and this was 26 April.

repeated twice, or thrice before March, 1770; and kept clean, and neat.

The broad-caſt ſowing work, was performed at the ſame time; (I mean the hoeing them out in May) with a ten-inch hoe: and this was repeated twice afterwards. The laſt was given in March, 1770: ſo here was three hoeings by hand well performed: and now behold the effects.

	tons.	cwt.	q.	lb.
Two acres planted produced, when ſpent, each of them - -	34	1	1	20
Product of the drilled acre was found to be in winter - -	23	1	0	0
Product of the broad-caſt ſowing no more than - - -	18	2	0	0

Hence we learn what is fit to be done in cultivating theſe roots.

Manner of ſpending in April, and May, 1770, by cows.

Eight milch-cows firſt eat off the tops, and were ſo fed in the day-time between five and ſix weeks; but when taken home to the ſtraw-yard, at night for milking, had ſtraw given them: ſome eat little, ſome none. I obſerved the milk and butter both good.

Turnep-rooted cabbage continued.

Manner of ſpending with ſheep, in April, and May.

The ſheep followed the cows, and eat the roots, —having *freſh* ones thrown up every day. Fold-gates were pitched to confine

confine both cows and ſheep thereon, beſides many cart-loads were brought home daily, and given to hogs and pigs, (but of theſe laſt I have no minutes.) The roots kept three hundred and ſix ſheep thirty days in the very beſt manner, without any other food. I obſerve, the whole flock thrive remarkably well: and what is ſtill more eſſential, enrich the ground for the future, &c.—Sheep eat much leſs of theſe roots, than of any other roots, and herbs; and what is ſtill more, thrive much faſter too.

N. B. The whole product of theſe four acres was one hundred and nine tons, and upwards.

Borecole, and Scotch kale (four acres cultivated.)

Culture. Here again, as was done for turneps, we ſtruck furrows with a double drill-plough twenty inches apart; *ſix in depth for two acres.*—

Seeds. Sown the 6th March, 1769, in the aforeſaid furrows: allowing one pound per acre, from whence plants were drawn, to ſupply the other *two acres* deſigned for planting: leaving *theſe* ſufficiently furniſhed at about one foot apart from each other in the rows. Hence, it is eaſy to conceive, that when all the ſuper-

numerary plants were drawn off, the crop would ſtand twenty inches by twelve: all which being ſkilfully executed, anſwered very well.

Planting of *two* acres, viz. one of borecole, and one of Scotch kale. This work was performed the latter end of May. The plants ſtood two feet by eighteen inches. The whole was well huſbanded both in hand and horſe-hoeing, as became requiſite.

Succeſs and obſervations.

Scotch kale ſeems to be a very mean thing, not worth culture in the field for cattle of any kind. Here was a fair trial by ſowing and tranſplanting. Product four tons and a half only upon two acres.

Borecole ſeems equal, if not ſuperior to cole-ſeed, for feeding ſheep, eſpecially in deep ſnow. For it has a tall ſtem four feet high, branched throughout; from whence ſheep may have good proviſion at all ſeaſons during winter: and, being very hardy too, I think, well deſerves propagating. I find it meliorates the land greatly. For I had a noble crop of oats laſt year after it, upon brick-earth, cold land—The borecole ſuffers greatly by tranſplanting: as it has exceſſive long roots, which, being tough, break, and become very injurious to its future growth. This was ſo apparent in the caſe before us, that

no

no one could think the plants one and the ſame ſpecies. Thoſe unremoved were vaſtly ſuperior to thoſe tranſplanted. Happy circumſtance this to the huſbandman; and gives me great pleaſure in relating it.

	Tons.
Product of the untranſplanted acre amounts to	21
That of the tranſplanted acre not quite - -	11
The whole of the two acres	32

Eight milch-cows were fed one week, to ſee what effects this herb had on the milk and butter: both proved good.— Fed off by cows and ſheep, in December 1769, and Jan. 1770.

The remains kept three hundred and twelve ſheep eight days, with the Scotch kale included: both cows and ſheep liked their entertainment very well (but both had ſtraw all night.) Folded the ſheep.

Remarks upon the whole ſixteen acres.

I obſerve, that ſheep eat more turneps per day than of any other herbs and roots conſiderably. Thus having given a ſhort account of theſe herbs and roots, &c. promiſcouſly, I bring the whole into one view.

Product of Herbs and Roots compared.

Herbs.

	Tons.	Tons.
Cabbages	48, or	12 per acre.
Borecole	32, or	16 per acre.
Scotch kale	4, or	28 per acre.

Roots.

	Tons.	Tons.
Turnep-rooted cabbage	27, or	4 per acre.
Turneps -	24 per acre.	

	Tons.
Total of the roots	96
Total of the herbs	109 *

* No decisive inference can be drawn from this view of the product of the roots, and herbs, with respect to the comparative value of each species; or the whole of the herbs and roots collectively with regard to each other. The crops of all were small; and some very much so: and Mr. Reynhold himself explains the accidents, as well as the less advantageous method of culture of part, instituted for the sake of trial, by which they failed.—The turnep-rooted cabbage is here only rated at four tons per acre: whereas Mr. Reynhold, in one of his letters, mentions fifty, and even sixty tons per acre of this plant having been obtained:—and it is well known, that lord Shannon obtained in Ireland as great a crop of the common turnep.—There are, however, many valuable observations on the several plants, both with respect to the mode of culture, and the quality of the subject.

To

To Mr. *More*, Secretary to the Society for the Encouragement of Arts, Manufactures, and Commerce, London.

SIR,

IN the month of May laſt, I ſent you a ſet of experiments, made on herbs and roots, compared on a large ſcale (ſixteen acres), to which no anſwer has been returned. Thoſe trials were made on fallows, without manure. My zeal in theſe matters has ſince led me further on, in 1771, to make other experiments, on a ſmall ſcale, with manure, in order to ſee, which might prove moſt beneficial to the huſbandman. This knowledge being obtained, I am going to give you an account of theſe laſt experiments; the firſt you have already.

However, this is not offered as a full compariſon between the two crops of 1770 and 1771: becauſe there is a change of ſome particulars herein; yet enough may be gathered from the two accounts, to determine which courſe ſeems beſt to be followed. I mean that of raiſing a ſtock of winter-proviſions for cattle, in the beſt manner; a thing no one could well know without ſome experiments to guide them. —Here follows my performances for the year 1771.

Par-

Particulars of the culture, product, expenditure, expences, and profit on one acre and a quarter of land cropped with carrots, potatoes, Scotch cabbages, Siberian borecole, Anjou cabbage, and Jeruſalem turneps, in manner following.

Soil. A good deep gentle loam, yielded beans in 1770; and was very clean when the crop came off.

Culture. Plowed in September, immediately after the crop was in barn, ten inches deep. Then thick-folded with ſheep's dung. After this, trenched up into ſmall ridges of two feet each, with a double wreſt-plough the ſame depth. Thus it remained all winter. February, 1771, the ridges were ſlit down, and reverſed the ſame depth as before. March 20th, harrowed down, and plowed level croſs-ways, with a turn wreſt-plough, ten inches deep. —Now the land was divided into five equal parts, deſigned for ſix experiments on herbs and roots, compared as above mentioned. Began with

Carrots, one rood: Experiment Numb. 1.

Seed. Sown twenty ounces, March 20th, in twelve-inch drills, made by a double drill-plough, five inches deep: harrowed in thrice at a place: laſt week in

May, was horſe-hoed, and harrowed croſs the rows. Plants were cut out to about ten inches apart; hand-hoed twice after; thrice in all.

The crop proved good: was dug up in December. Product one hundred and forty-ſix buſhels, fifty-ſix pounds per buſhel: ſpent in feeding hogs: and for this purpoſe may, now corn is dear, be deemed worth one ſhilling per buſhel; and could have been ſold for more at Canterbury.

American potatoes, one rood: Experiment Number 2.

Culture the ſame, only with this difference, viz. previous to the laſt plowing (the 20th March), this part was littered with ſix cart-loads of long rough dung, turned into the furrows, by a boy going along-ſide the plough, to prevent choaking. Sets were dropped after the plough one foot aſunder, at the ſame time in every other furrow; and covered with the plough on its return, five inches deep: the horſes going on the land lengthwiſe to prevent treading on the ſets. By this method, the crop ſtood in rows two feet diſtant: was harrowed down, about ten days after planting, twice at a place: which deſtroyed many young weeds; and left the ſurface very fine, and neat. Horſe and hand-hoed twice each, occaſionally earthing

ing them up afterwards with a double wreſt-plough. The crop was forked up in October. Product one hundred and forty buſhels, fifty-ſix pounds to the buſhel: ſpent in fatting hogs, boiled, and mixed with barley-meal, in proportion of nine buſhels of potatoes, to one of meal: anſwered exceeding well. Never had better pork; and, in this reſpect, may be deemed worth one ſhilling per buſhel (firing included), under the preſent dearth of corn, but could have been ſold to a much better advantage for the table; had that been the point in view.

Siberian bore-cole, one rood: Experiment Number 3. An untrodden path.

Culture was the ſame as Numb. 1. This rood was ſubdivided into three parts. One third was ſown in drills, the 23d March, in rows two feet apart. Another third the ſame time in broad-caſt—Thus theſe crops ſtood till the beginning of June. Then the plants were drawn out of the drilled part, leaving the crop at about two feet aſunder in the rows, with the plants drawn out. The remaining third was tranſplanted in rows at ſeveral diſtances, viz. twenty-four inches by eighteen, and eighteen inches by twelve, and twelve by nine. This done, the broad-caſt part was hand-hoed, and the plants cut out to the diſtance

of

of ten or twelve inches: hand-hoeing was repeated twice after: thrice in all. The drilled part was horſe and hand-hoed twice each, and earthed up with a double wreſt-plough afterwards. The tranſplanted part was performed in ſame manner, where the rows would permit. The reſult was, thoſe tranſplanted were all near alike; no viſible difference; very mean, compared with the drilled crop; and full one third leſs in weight when ſpent. The broad-caſt exceeded the tranſplanted full one-fourth: and the difference between the drill and broad-caſt was about one-eighth in favour of the drill-crop. From hence, we may ſafely affirm tranſplanting is injurious: and it is, likewiſe, as certain, that an addition of more plants than are ſet out, in the drill-crop, would rather leſſen than, by any means, augment the growth, whatever ſome conjurers in huſbandry may think to the contrary.—The product was four tons, ſpent in April by one hundred and twenty-five ſheep (tegs), in four days. This good keeping, ſo early in ſpring, may be deemed worth three pence per week, which fixes their value at one pound two ſhillings and ſix pence. From hence it appears, that theſe animals eat twenty pounds per day each, on a common average. They liked their entertainment very well: and excellent food it is no doubt for them. I have

before,

before, as a candidate, mentioned their utility for feeding milch-cows, ſo it needs no repeating. I want to know what others ſay of this plant. It ſeems to merit attention truly.

Scotch cabbage, one rood: Experiment Number 4.

Seed, ſown 2d April, 1771. Gave this rood a fifth plowing, ten inches deep, 20th June: and rolled it down immediately, unharrowed. By this means, the moiſture is beſt retained in the earth for the reception of the plants; and the furrows remain viſible for the planters to work without a line: a conſiderable advantage to the workmen. The plants were drawn, and ſet out the next day (21ſt June), in ſquares of two feet ſix inches: horſe and hand-hoed twice: each, occaſionally, was earthed up afterwards, by a double wreſt-plough.—Product eight tons and a half: ſpent by ſheep in April (the firſt week): and maintained one hundred and twenty-ſix tegs, ſeven days, to their very good liking. This keeping, at three pence per head per week, comes to one pound twelve ſhillings. N. B. This crop was in ſome places much injured by catterpillars: but what is remarkable, theſe inſects never touched the bore-cole, nor the turnep-rooted cabbage, that ſtood here and there for trial: and ſo it

it happened the preceding year. A happy circumſtance this.

Anjou cabbage, half a rood: Experiment Number 5.

Seeds ſown 2d April.—Culture and performances the ſame as the Scotch cabbage in every degree.—Product (ſuch as it was, very mean) two tons and a quarter, cut off cloſe to the ground, was carted home; and given to milch-cows in March: which eat the leaves and tops very well. But no cattle like the ſtalks; and no wonder, ſince they are as hard as green wood; and riſe between four and five feet in height, being two inches in diameter; and the weight of them being equal to that of the eatable part. Deduct this: and the plant is not worth culture for ſpring-food, compared with many others. Henceforth let no one ever give himſelf the trouble of raiſing it, unleſs in want of firing: for it ſeems better adapted for that purpoſe than feeding cattle.—However, in juſtice to the great works of nature, it muſt be acknowledged the whole was eatable in autumn, by chopping the ſtem to pieces: but that being a ſeaſon when ſuch proviſion is not wanted in our climate, it ſeems needleſs to propagate it. The growth may be deemed worth five or ſix ſhillings: but the expence in carting home was near as much. So fare well Anjou

jou cabbage. Much has been ſaid concerning the utility of this plant: but it is not in the leaſt to be regarded.

Experiment Number 6. Half a rood of Berlin greens, vulgarly called Jeruſalem turneps.

The culture the ſame as in the two laſt experiments—The ſeed ſown the 2d of April, 1771.—Plants were drawn and ſet out, the 21ſt of June, in ſquares at eighteen inches. Product about one ton and a quarter, ſpent by divers kinds of ſheep, and lambs, the 2d week in April. All liked their entertainment very well. This herbage was well worth five ſhillings.—At that rate, an acre would be worth two pounds, and it ſeems equal, if not ſuperior to cole-ſeed, for feeding ewes, and lambs, in ſpring: being very hardy, and may be propagated either by broad-caſt, or tranſplanting.—The root bears no reſemblance to a turnep. How it obtained this name, I cannot conceive. The plant has abundance of thick ſpreading leaves and ſprouts, which afford good eating for man and beaſt. I have raiſed them many years for the table; and find the froſt does not affect them near ſo much as it does other greens: and what is ſtill more, hitherto no inſects, as I obſerve, whatſoever, annoy them in the leaſt. N. B. They make a good tilth for barley.

Ex-

Experiment Numb. 7. Carrots, and turneps compared in feeding ſheep.

From another field, two tons of turneps drawn the laſt week in November, 1771, the tops and tails cut off, were brought home, and houſed for ſpring-food. As was, likewiſe, two tons of carrots at the ſame time (November, 1771) cleanſed and topped for the ſame uſe, in order to ſee which of the two would go fartheſt in feeding theſe animals.—February 1ſt, 1772, the turneps when ſliced, were given to fifteen ſheep; which liked them very well; and were maintained by them the fourteen days following; a little pea-ſtraw being given with them.—When theſe were done, the carrots were given in like manner: and they kept the ſheep exactly the ſame time, fourteen days; which, taking both, makes twenty-eight days.—From hence it appears again, that they eat about twenty-pounds per day each; and that there is no difference between either of theſe roots for ſheep-feeding in point of value. Both ſtand on the ſame footing here. An inſtructive leſſon to the huſbandman: for it ſhews us, what an amazing diſproportion there is betwixt feeding ſwine, and ſheep upon carrots, with reſpect to value. For, if given to hogs, they amount to four

pounds: but eaten by ſheep, not eight ſhillings: reckoning three pence per head per week. From hence, we learn too, that turneps may be preſerved through the winter, and kept good for ſpring-food during pleaſure: things of no ſmall moment, but indeed of great uſe for ſtall-feeding beaſts; a diſcovery, I dare ſay, unknown to moſt of the farmers in Europe; and what is ſtill of further conſequence herein, houſeing theſe roots ſeems to ripen, and improve their quality, ſo far as to render them more ſerviceable for ſtock.—I find my ſheep eat ſix or ſeven pounds per day each leſs of theſe, than of thoſe ſpent in a growing ſtate. This will appear very plain by comparing this experiment of 1772, with that made laſt year, 1771, on turneps ſpent in the field.—Happy circumſtances theſe.—February 29th, 1772, out of curioſity, I treated theſe ſame fifteen ſheep with potatoes only for one day: and they eat three hundred and fifteen pounds; which is twenty-one pound per head each ſheep. Theſe roots were of the common kind, not American, or thoſe called Cluſter.—Having thus given an account of my performance, I will bring the whole into one view.

Product of each kind of herb and root, and their value:

		Tons.	hund.	lb.	£.	s.	d.
Experim. No. 1.	Carrots 146 buſhels	3	13		7	6	0
2.	Potatoes 140 buſh.	3	10		7	0	0
3.	Siberian bore-cole	4	0		1	2	6
4.	Scotch cabbage	8	56		1	12	0
by one rood 5.	Anjou cabbage	2	28		0	6	0
6.	Jeruſalem turneps	1	28		0	5	0
	Total of the whole 5 roods				17	11	6

Charge and expences to be deducted.

	£.	s.	d.
Rent, tythe, and pariſh-rates, &c.	0	18	6
Plowing of all kinds	1	7	6
Folding thick, deemed worth	2	2	0
Harrowing and rolling	0	3	6
Seed and ſeed-bed	0	7	6
Potatoe-ſets, and cutting out	0	14	6
Drilling and planting, all kinds	0	12	6
Hand and horſe-hoeing, and earthing up with a double wreſt-plough	1	5	6
Digging up carrots, and potatoes	0	13	0
Carting home theſe and Anjous	0	15	0
Dung and carriage for the potatoes, and ſpreading it	1	1	6
Firing for potatoes being boiled for hogs	0	12	0
Total expences	10	13	0
Remain profit	6	18	6

Thus, having given a plain account of the two years experiments, I leave the reader to chuſe what courſe, he likes beſt to follow. Here are precedents enough for any reaſonable man's purpoſe, made both with, and without manure; and both too,

attended with as much ſucceſs, as could well be expected from the nature of theſe things. Therefore, I truſt this work may be of ſome uſe to my countrymen, provided they merit the approbation of the honourable Society of Arts, &c. ſo far as to publiſh the performances here tranſacted. But on the contrary, if deemed of no weight, they may be returned to the author with ſuch anſwer as they deſerve, be it only to point out my errors.

Before I conclude, ſir, give me leave by way of entertainment to inſert

A Caution, with ſome Obſervations thereon.

The ſuperior profits ariſing from the culture of carrots, and potatoes, may poſſibly lead ſome people ſo far in their favour, as to neglect the culture of any other roots, and herbage: as being things quite unneceſſary for their purpoſe. Admit this: and then the conſequence will be, that two acres muſt be appointed for this purpoſe, inſtead of one; becauſe it is experimentally certain, that twice as much food may be obtained from a given quantity of land, cropped either with cabbages, or the turnep-tribes. We ſee this fairly proved, both from this, and the laſt year's experiments, confirmed too by many other practitioners, as well as myſelf, mentioned by Mr. Young, in his ingenious Annals of Huſbandry.

The

The grand object, the farmer has in view, is to raiſe a competent ſtock of winter-proviſions for his cattle, in the very beſt, and cheapeſt manner he poſſibly can. But give me leave to ſay, ſir, this good end will never be obtained from the culture of carrots and potatoes, excluſive of other roots, and herbage that can be had, ton for ton, equally ſerviceable, cent. per cent. cheaper; and attended with much leſs pains and labour beſides.—I am not ſenſible of any material difference there is between a ton of carrots, potatoes, turneps, or any other of the cabbage-tribe for feeding ſheep, and neat cattle: but, in feeding ſwine, indeed, there is in the ſecond. The firſt have, in this preſent dearth of proviſions, undoubtedly much the preference. They being now called in very ſeaſonably as ſubſtitutes for corn, that commodity being at ſo very high a price: otherwiſe carrots and potatoes can be of no more real worth for feeding beef and mutton, than the food ariſing from turneps, cabbages, or any ſuch like herbage, compared ton for ton, one with another. I am no advocate for one vegetable, more than another. What I contend for is, that of a right application. Let each individual be directed to thoſe animals, where found moſt beneficial: otherwiſe we thwart the gracious deſigns intended by nature, and labour in vain. Give

the carrots and potatoes to hogs and horſes, ſo long as they anſwer well, and remain good: but let them not become ſubſtitutes for other vegetables, that we know, and are ſure will in general afford us much larger products equally ſerviceable, pound for pound, on much better terms. For be the potatoe and carrot-crop ever ſo great, ſtill abundance more may be had from the cabbage and turnep-tribe, where the culture is well directed. As in theſe more enlightened days of huſbandry, forty or fifty tons per acre are now frequently obtained, where formerly not more than one-fourth or fifth of that quantity was the product. In ſhort, whoever thinks to ſubſtitute potatoes and carrots in lieu of the turnep and cabbage-tribe, for his ſheep and neat cattle, as an improvement in agriculture, will find himſelf miſerably miſtaken. So here I reſt; and wiſh the beſt for the good of the community. My dutiful reſpects attend the honourable Society of Arts, &c.

I am, Sir, with all due reſpect,

Your moſt humble ſervant,

Adiſham,
18th April, 1772.

JOHN REYNOLDS.

To Mr. *Samuel More*, Secretary to the Society for the Encouragement of Arts, &c. in the Strand, London.

SIR,

IN obedience to the requeſt of the Committee of Agriculture, I ſend the methods uſed for preſerving carrots, turneps, and potatoes, in winter, either for ſpending ſooner, or later, as the caſe requires.

POTATOES muſt have cloſe lodging, free from froſt; otherwiſe they will rot, and infect others: thin ſlight buildings, ſuch as boards, lath, and plaiſter, &c. ſhould have their inſide well lined with ſtraw or ſtubble of ſome kind, before the matters to be preſerved are placed therein: and when they are houſed well, they ſhould be covered over with the ſame. It is likewiſe neceſſary, that ſuch, as are forked up in the day, ſhould be houſed or covered at night. For the leaſt froſt has a very bad effect on theſe roots; and which, although not immediately ſeen, will in time prove fatal without any remedy of cure. Therefore it is alſo abſolutely neceſſary to guard againſt it, both at home and abroad.

TURNEPS ſhould be drawn when dry, cutting off the tops and tails.—Theſe may be houſed at pleaſure; but not when

frozen; for that is injurious. We make choice of the largeſt, that grow above ground, when full grown, for ſtall-feeding. Leave the remains for ſheep: which latter helps to improve the land for the enſuing crop. Things eſſentially neceſſary, and well deſerving our notice.—When houſed, a covering of pea-ſtraw is needful; becauſe they ſlice better than when frozen; and are moſt agreeable for the ſtock's eating. And it is certainly the beſt way to houſe them five or ſix weeks before ſpending: becauſe forty buſhels will, I am confident, go as far as fifty eat in a growing ſtate. I am ſpeaking now of ſtall-feeding beaſts more particularly than of others. I find ſuch as are well got in, either in the months of November or December, will keep good to the 10th of April. Two farmers, beſides myſelf, in this neighbourhood, houſed five or ſix acres, on my recommendation, in November: which were not all ſpent till the latter end of March; but held good four months. This ſurely is ſufficiently ſatisfactory, not to admit any doubt about the keeping.

CARROTS may be kept ſafely for ſtall-feeding, in two ways: either in barn or in the field. If the latter be choſen, cut off the tops, and cart them into a ridge, or heap, made like the roof of an houſe, of a triangular form, with a baſe of ſix

or

of ſeven feet wide: throwing them up with forks, as many feet deep in length, as the caſe requires.—Cover them with wheat ſtubble, ſufficiently to keep out rain. Froſt has little effect on theſe roots. It may be neceſſary to dig a ſmall trench along the ſides, for drains; and to fence them in with hurdles; nothing more is needful. They require no ſlicing, but may be ſpent at pleaſure. For ſheep-feeding, they may be forked up, and ſpent, where they grow, by folding off in like manner as turneps are conſumed: and, in ſo doing, the land will be improved thereby. I hope this account will be ſatisfactory, but ſhould any thing be deficient, you need only point it out, and it ſhall be anſwered.

I am, Sir, with all due reſpect,

Your moſt humble ſervant,

Adiſham,
4th May, 1772.

J. REYNOLDS.

SIR,

IN my laſt, which was, indeed, wrote in too much haſte, there is an omiſſion of one circumſtance with reſpect to preſerving of turneps, that is neceſſary to be known; which is this, viz. where a large growth is intended for houſing, ſuch as amounts to thirty

thirty or forty tons, or more, it will not be improper, whilſt theſe are bringing in, to litter them over with dry ſtubble, or ſtraw of any kind, when three feet thick of roots; and to keep repeating it again at every yard's depth, till the whole be laid up: covering the top, as was aforeſaid, with ſtraw, to keep out the froſts. The mixing of ſtubble, or ſtraw, between turneps, will prevent what ſometimes happens, when a great body is brought together at once of theſe vegetables, an immoderate heat; which makes them in the end to become mouldy, and ill-taſted.—I thought this precaution neceſſary to the end, no one might ſuffer ignorantly in ſo doing: as this is an eaſy remedy, whether wanted or not.

Let this be annexed to the Turnep article, and then, I truſt, it will be completed.

I am Sir, with all due reſpect,

Your moſt humble ſervant,

Adiſham,
8th May, 1772.

J. REYNOLDS.

Mr.

Mr. *Jeſſard*'s Certificate of his cultivating the Turnep-rooted Cabbage.

To the honourable Society for the Encouragement of Arts, Manufactures, and Commerce, in London.

Minſter, Iſle of Thanet, May 12th, 1771.

MY LORDS, AND GENTLEMEN,

THE great benefit and ſucceſs, I met with laſt year, induced me to become a candidate, in raiſing turnep-rooted cabbage*; ſeeing your honourable Society have

* The turnep-rooted cabbage was firſt cultivated in England, as an article of agriculture, by Mr. Reynolds of Addiſham, in Kent, in 1778. The means of its introduction, with Mr. Reynolds's culture, and obſervations on it in that year, were communicated to the Society in three letters, writtten in May, 1768, inſerted in the firſt volume of theſe Memoirs, Article IX. page 419. An account alſo of the botanical hiſtory of this plant, with ſome further explanation of its uſes, both with reſpect to huſbandry, and the table, are inſerted in Article X. page 443, of the ſame volume.—Mr. Reynolds gave a ſupplemental relation of his later obſervations on this plant, in a letter, dated September the 3d, 1768, inſerted in the ſecond volume of theſe Memoirs, Article V. page 41. Mr. Jeſſard, likewiſe, from whom this certificate was ſent, communicated to the Society a relation of his culture of this plant, in 1769, with remarks on its utility, in two letters, inſerted in vol. II. of theſe Memoirs, Article XVIII. page 343: the firſt of which, was accompanied with ſpecimens of the roots and herbage, for the inſpection of the Society.

offered

offered three premiums for this purpoſe. I have the honour of being a claimant in the third claſs, No. 62: having raiſed five acres, three roods, and thirty-three perches of the ſaid roots, as will fully appear by the incloſed certificate *.

The ſoil, culture, time, and manner of feeding off, produce and effects on cattle and ſheep fed with it, I am going to lay before you; wherein you will find the ſame method purſued as in the laſt years.

Soil. A gentle loam, intermixed with gravel.—Had a wheat-crop the preceding year.

Culture. The land had five dry-plowings, about eight inches deep, the firſt in October, 1769; the laſt about the middle of June, 1770: and the land was dreſſed down fine to receive the plants.—One half part was manured with dung and mould, mixed together; and laid on, at the rate of forty cart-loads per acre. — The remainder part (a few perches only excepted) was well folded over with ſheep. I obſerved but little difference between the two.

* The Society were induced, by the account given by Mr. Reynolds (as mentioned in the preceding note), to offer, in the year 1769, premiums for the cultivation of this plant: which have been continued to the preſent. This certificate was ſent to the Society by Mr. Jeſſard, in claim of one of theſe premiums for the year 1770; and he accordingly obtained it.

The

The dunged ſeem rather beſt; but, as the folding is the cheapeſt manure, that ought to be followed, when it can be well obtained. Thoſe plants, where there was no manure, were much inferior.—The ground was hand-hoed between the plants in Auguſt, for the firſt time; and thrice horſe-hoed afterwards, as the weeds aroſe.—The laſt was given in the beginning of March, 1771: and the plants were then earthed up: which helps their growth greatly.

The 25th of April, 1770, one pound upon fourteen perches of good warm ſoil. Seed ſown.

The latter part of June, and beginning of July, in two-feet intervals: allowing about ſeventeen plants to a perch. This work coſt me twelve ſhillings per acre. Planted.

N. B. A trowel is beſt for this purpoſe, ſuch as is uſed in planting of madder.

I have ſent ſix more of the roots for the inſpection of the Society, indifferently choſen. They weigh thirty-eight pounds, ſo that, upon an average, at this time (viz. the 29th of April), there is no leſs than thirty-five tons per acre. *And let it be obſerved*, they are not full grown. The ſpring being backward: otherwiſe the product would have been greater*. Product.

* In a letter from Mr. Reynolds, dated the 15th of January, 1774, read to the Society, he ſpeaks thus of the

Feeding with ſheep.

I pitched a fold, in the form of an oblong, in two diviſions, and placed therein three hundred and eighty-ſeven ſheep, the ſecond of April, 1771. The crop has kept them exceeding well, without any fodder, or even any other proviſion (ſave only the turning them into a rough paſture, a few hours in the middle of the day, for by ſo doing, they return freſh to the roots in the afternoon); and will maintain them in the ſame manner,

the produce of the turnep-rooted cabbage. "This is "certain, large crops have been obtained within the "two laſt years in ſeveral counties. Their product have "riſen from twenty-five to thirty-five tons per acre. "And if my memory ſerves me right, there are two ac- "counts from Nottingham and York, as high as forty- "four tons. Kent and Suſſex have obtained near fifty "tons: but one gentleman, in Surry, has outdone all "that I have yet heard of. This plantation, and that "no ſmall one, produced upwards of fifty-ſix tons per "acre, in 1770. I have this well atteſted; and that "many of his ſingle roots weighed fourteen pounds "each. This may ſeem incredible to ſome: but it is "not ſo to me in the leaſt. For my ſhepherd brought "me in one ſingle root, on the 4th of May, 1773, that, "when cleanſed, weighed ſeventeen pounds. The moſt "extraordinary plant of this kind ever beheld. My cu- "riofity led me to ſee where it grew: and, on viewing "the place, I found it ſtood where a heap of graſs-burnt "aſhes had been ill ſpread: and this occaſioned its ex- "traordinary ſize." Mr. Reynolds's concluſion, with reſpect to the great magnitude of this root, is juſtified by many inſtances of extreme great crops of the Braſſica, or cabbage kind, being produced on land, after burn-baiting; and even after burning the turf of heathy moorland, without any other manure.

till

till the twelfth of May, I am confident; which is in all full forty days.—I placed thoſe deſigned for fattening in the front; and the ſtore-ſheep in the rear. The plants are drawn up with a three-pronged hoe. The fold is removed daily, for thoſe in front to have freſh food: and thoſe in the rear eat the remains of what was left the day before. Thus the whole is ſpent without the leaſt loſs: and the land enriched at the ſame time.—This, I ſay, by experience gained laſt year. For my barley crop, on land in the ſame ſtate, turned out very good, both in quantity and quality inferior to none of my other growth (which was upwards of eighty acres); the product full five quarters per acre, ſown the 12th of May.

Eight milch-cows have been fed with theſe roots for this month paſt; and are very fond of them. Feeding cows.
And I have found great ſavings in my hay, ſince they began them. Both the milk and butter proved very good: and a conſiderable increaſe in both kinds.

I alſo find, that hogs and pigs like them extremely well. Sows gives plenty of milk when fed with theſe roots.

Now, gentlemen, let me crave your attention, whilſt I make a few obſervations on theſe valuable roots, ſo eſſential in huſbandry.

Upon

Remarks. Upon the whole, it is very certain, that theſe roots are found to be of the greateſt utility.

Nothing, that I can find out, is more beneficial to the land-holder, *for ſpring-food*, eſpecially in hard weather, and times of diſtreſs; ſuch as we have of late very ſeverely felt.—This conſideration *only* ought to encourage all concerned in raiſing them, were there no other motive whatſoever. But that is not the caſe. For I find, that beſides this great good, *of giving plenty in time of need*, there is another benefit annexed to it, viz. the improving land for the enſuing crop, when theſe roots are ſpent with ſheep, where they grow. Theſe are circumſtances of the greateſt merit in agriculture; eſpecially to thoſe who have them in poſſeſſion.

Theſe roots are proof againſt froſt. Whereas turneps have been but of little ſervice in general this ſpring; the froſt having deſtroyed many of them long ago. But theſe vegetables are now in a fine flouriſhing ſtate, quite ſound, and good; well taſted, top and bottom: better food cannot be deſired for horned cattle, and ſheep. It ſeems, indeed, the very thing long ſought for, (namely) good ſpring-food.

This is certain, my ſheep are now thriving beyond all expectation: whilſt other flocks, in general, having no ſuch proviſion, are

are almoſt ſtarved to death for want of ſuſtenance.

If what is here aſſerted, and proved by experience, will not induce people to raiſe theſe roots, I know not what will *. This is the fact be aſſured: and, as ſuch, I truſt, will merit your approbation.

I am, my Lords and Gentlemen,
with all due reſpect,
Your moſt obedient,
and humble ſervant,

Minſter, in the Iſle of Thanet,
29th April, 1771.

HENRY JESSARD.

* This account of the great utility of the turnep-rooted cabbage, is ſtrongly confirmed by ſeveral paſſages of Mr. Reynolds letter of January 15th, 1774, mentioned in the preceding note. He ſays, "With reſpect to my turnep-rooted cabbage, I find it is now propagated more and more in this neighbourhood, with all deſired ſucceſs; and begins to ſpread a-pace throughout every county in England and Wales; and in ſome parts of Scotland. It has been cultivated by an eminent North Briton, as he expreſſes it, *to their very good liking and advantage, and withal is much admired in bearing froſt very well:* which, according to his information, is more intenſe and ſevere than with us. I have letters to prove, they are in no ſmall eſteem in the kingdom of Ireland:—and I find they are recommended, by their Society, to all concerned in breeding and feeding cattle, to propagate."—Mr. Reynolds ſupports his aſſertion, in this letter, of the great utility of this plant, as a ſpring-food for cattle, and more particularly for ſheep, by the inſtance of what happened to him in 1773, "when moſt of the turneps, that had

To Mr. *Samuel More*, Secretary to the Society for the Encouragement of Arts, Manufactures, and Commerce.

Minſter, 12th May, 1771.

SIR,

THE favour of yours I received *.— The expences attending one acre of turnep-rooted cabbage is, as under.

	£.	s.	d.
Five times plowed, at five ſhillings per acre, harrowing and rolling included -	1	5	0
Forty cart-loads of dung: each load containing about thirty buſhels, at one ſhilling and ſix pence per load, carriage included	3	0	0
Carried over	4	5	0

" been ſown the preceding year, had failed; or thoſe " few that had eſcaped run away to ſeed much earlier " than common;" and the farmers, therefore, were in the utmoſt diſtreſs, at the ſame time that he, having no leſs than ſeven acres of this plant, felt no inconvenience.

* After the preceding letter had been referred to the Committee of Agriculture, it was deemed material, in order to the judging with more preciſion of the advantages of raiſing the turnep-rooted cabbage, to be more particularly informed of the expence, that had been incurred, by Mr. Jeſſard, in each particular of his culture of theſe five acres. The ſecretary was, therefore, directed to write, and inform him of the Society's wiſh, that he ſhould ſtate all the articles of expence attending the raiſing, and conſuming this crop. This ſecond letter was written accordingly, in anſwer to thoſe inquiries.

Brought

	£.	s.	d.
Brought over	4	5	0
Once hand-hoeing - - -	0	2	6
Three horſe-hoeings, at one ſhilling and ſix pence per acre - -	0	4	6
Tranſplanting - - -	0	12	0
Rent - - - - -	0	18	0
N. B. No tythe paid, when fed off with ſheep			
Seed - - - -	0	0	3
Total expence, if dunged,	6	2	3
One acre folded with ſheep is reckoned to coſt no more than one pound and five ſhillings.			
Difference from the dunged -	1	15	0
Total expence, if folded only,	4	7	3

I have one hundred weight of the ſeed to diſpoſe of, and can afford to ſell it at one ſhilling per pound.

I have within this month paſt ſold ſix pounds to the neighbouring farmers, who now begin to ſee the utility of thoſe roots.

I am, Sir, with all due reſpect,

Your moſt humble ſervant,

HENRY JESSARD.

ARTICLE VI.

Accounts of Methods of Rearing Calves without Milk, or ſaving it after a ſhort Time, communicated by Mr. BUDD, *Mr.* FORSTER, *and Mr.* CARR, *to the* Society for the Encouragement of Arts, Manufactures, and Commerce, *and inſerted at their Requeſt.*

To *Robert Doſſie*, Eſq.

SIR,

THE Society for the Encouragement of Arts, Manufactures, and Commerce, have directed me to deliver to you the ſeveral accounts communicated to them, of methods practiſed for rearing calves without milk, in order to their being inſerted in the Memoirs of Agriculture, if you think proper.

I am, Sir,

Your very humble ſervant,

SAMUEL MORE, ſec.

On

To the Society for the Encouragement of Arts, Manufactures, and Commerce.

GENTLEMEN,

HAVING obſerved in your book of premiums, for the year 1771, your offer of a gold medal for an account of the beſt method of rearing black cattle without milk; and having made many experiments, for theſe four or five years paſt, I am induced to become a candidate for it. I, therefore, lay before you the following method of rearing black cattle without milk *.

In two or three days after they are calved, I take the calves from the cows, and put them in a houſe by themſelves.—I then give them a kind of water-gruel, compoſed of barley about one-third, and two-thirds of oats, ground together very fine. I then ſift the mixture through a very fine ſieve; put it into the quantity of water (mentioned below); and boil it half an hour, when I take it off the fire, and let it remain till it is milk-warm. I then give each calf about a quart in the morning, and the ſame quantity in the evening; and

* This account was deemed fully ſatisfactory, and the gold medal was accordingly adjudged to Mr. Budd.

increaſe it, as the calf grows older. It requires very little trouble, to make them drink it.—After the calves have had this diet for about a week or ten days, I tye up a little bundle of hay; and put it in the middle of the houſe; which they will, by degrees, come to eat.—I, alſo, put a little of the meal, above mentioned, in a ſmall trough for them, to eat occaſionally: which I find of great ſervice to them.—I keep them, in this manner, till they are of proper age to turn out to graſs: before which, they muſt be at leaſt two months old. Therefore the ſooner I get them in the ſpring, the better.

About a quart of the above meal, mixed with three gallons of water, is ſufficient for twelve calves in the morning, and the ſame quantity in the evening. I increaſe the quantity in proportion as they grow older.

By this method, I have reared between fifty and ſixty beaſts within theſe four years: forty of which, I have now in my poſſeſſion; having ſold off the others, as they became of a proper age; and by the ſame method calves may be reared with a trifleof expence.

I am, Gentlemen,

Your moſt humble ſervant,

WM. BUDD.

No. 2, Somerſet-houſe Stable-yard,
Strand, October 10, 1771.

SIR,

HAVING obſerved, that the Society ordered a medal to be given for the rearing of black cattle without milk, I thought the Society would not be diſpleaſed with an account of feeding calves, intended for the market, and for butchers meat, without milk. Frequently accounts of improvement in huſbandry are handed about, which never have been tried, and can have no ſucceſs when put to the proper teſt by experience.

The account I preſume to lay before the Society, is founded on an experience of ſeveral years. A farmer's wife in Pruſſia, who had employed this method, kept it very ſecret: but keeping only two or three cows, and yet buying conſtantly ten or twelve calves, and fattening them in a ſhort time ſo advantageouſly, that the butchers always preferred her calves to thoſe they could get of other farmers, it was ſuſpected, ſhe had deviſed a new and cheap method in feeding them. Some of my relations afterwards learned this method from the farmer's wife; and found it anſwer better than the beſt milk for fattening calves. Becauſe, it not only ſucceeded in a ſhorter time, and gave the veal the moſt

delicate and ſavory taſte; but it made the meat whiter; and was upon the whole cheaper than in the common way; as the whole milk of the dairy could be ſpared for the purpoſe of making butter.—

The infuſion of malt, or freſh wort, is the ſubſtitute to milk. In ſummer, it may be given cold: but in winter, it muſt have the ſame degree of warmth, as the milk juſt coming from the cow. The quantity is the ſame, as the milk commonly given at once to a calf: and it muſt be increaſed in proportion as the calf grows.

I wiſh, that in caſe the Society ſhould approve of it, a new trial may be made of this method; and if found to anſwer the purpoſe, that it may be publiſhed for the benefit of the public: as a great quantity of milk may be thus ſpared for the purpoſe of making cheeſe and butter, in order to reduce theſe two articles of our proviſions to a more moderate price than they have hitherto been.

Before I leave this ſubject give me leave, ſir, to communicate to the Society another cheap method employed in Pruſſia for rearing black cattle. After the expreſſion of the linſeed oil from linſeed, the remaining huſks, or droſs, are made up into round balls, of the ſize of a fiſt, and afterwards dried. Two or three of theſe balls are infuſed, and diſſolved in hot water: and a third or fourth

part

part of freſh milk is added in the beginning; but afterwards, when the calves are grown, the farmers employ only the ſkim-milk, which they mix with the infuſion. If this method ſhould deſerve the attention of the Society, it would at once ſpare great quantities of milk towards making cheeſe and butter; and afford a good uſe for the droſs left after the expreſſion of the linſeed oil.

As the ardent wiſh, to be of ſome ſervice to mankind, by every little addition in ſaving huſbandry, and a view to reduce the exorbitant price of proviſions to the poorer, and manufacturing part of my fellow-creatures in this country, prompted me chiefly to draw up this account, I hope it will meet with approbation from the Society, if not on account of its real merit and uſefulneſs, at leaſt for the intention, and like endeavours to fulfil, in ſome meaſure, thoſe great and noble purpoſes of humanity, and patriotiſm, which the Society itſelf propoſes in all its tranſactions.

I am, with due regard,

Your moſt obedient,

and humble ſervant,

JOHN REINHOLD FORSTER.

Extract of a Letter * from Mr. *Carr*, reſpecting the Rearing of Calves, in ſuch a Manner as to ſave the Milk.

IT is well known by ſome of the old houſewives of Norfolk, to this day, the manner of rearing calves is with fleeted milk and water warmed: which being too lean and thin, turns ſour within them, and ſometimes kills them; but in general they are pot-bellied, with their hair ſtaring: and ſometimes they turn louſy, which ſeldom is cured till young graſs purges the bad humours off: which effect is cuſtomary alſo with reſpect to hogs.—In large dairies they always put their fleeted milk into a ciſtern, from day to day, in order to turn ſour, and curdle before they give it them; and even they put an equal quantity of water to it: otherwiſe it heats and binds them; wherefore they will not take enough to fatten them. But from the cooling quality of the water they will drink twice as much when thus mixed: and we find, from experience, they do much better in this way.

The beſt method I ever found of rearing calves, and which I have purſued for thirty

* The other parts of this letter regarded the culture of wheat in the ſpring: and have been before inſerted, Article III. page 77.

years,

years, is to take them off the cows in three weeks, or a month; and to give nothing but a little fine hay till they begin, through neceſſity, to pick a little. I then cut ſome of the hay, and mix it with bran and oats in a trough, and ſlice ſome turneps about the ſize of a crown-piece: which they will ſoon, by licking for want of liquor, learn to eat. When the work is thus done, give them but turneps enough, and they will do well. Give them no water, unleſs the turneps be left off.

ARTICLE

ARTICLE VII.

Obſervations on the Damage done to Arable Land, by carrying off the Stones from the Surface; in a Letter from Mr. PRICE:— *and an Account of a Method of preventing Blights on Fruit-trees, and eſculent Plants, in two Letters from Mr.* GULLET;— *communicated to the* Society for the Encouragement of Arts, Manufactures, and Commerce; *and inſerted at their Requeſt.*

To *Robert Doſſie*, Eſq.

SIR,

THE Society for the Encouragement of Arts, Manufactures, and Commerce, have directed me to deliver to you a letter from Mr. *Price*, on the damage done to land by picking off the ſtones; and two letters from Mr. *Gullet*, on the preventing blights on plants; in order to their being inſerted in the Memoirs of Agriculture, if you think proper.

I am, Sir,

Your very humble ſervant,

SAMUEL MORE, ſec.

Mr. Price's *Obſervations on picking off Stones from Arable Land.*

To the Honourable Society of Arts, Manufactures, and Commerce.

IT has been a thing well known, for a great while, to ſeveral of the moſt experienced farmers, in many parts of England, that taking away the ſmall ſtones and flints is highly detrimental to almoſt all kinds of plowed land, but particularly ſo to thin ſtapled, or light lands; and likewiſe to all lands of a binding nature.—This I find has been long the opinion of many ſkilful farmers in different parts of the kingdom: but it never did, I believe, enter the thoughts of any one till of late years, that the damage could be nearly ſo great as it is now found to be, ſince unuſual quantities of flints, and other ſtones, have been repeatedly gathered for the uſe of the turnpike-roads.—Indeed, the damage done by this practice to many kinds of land, eſpecially to ſuch as are mentioned above, is found to be ſo great, as to be almoſt incredible to any one, who has not particularly obſerved, for a number of years, the progreſs of this deſtruction.

I ſhall, therefore, here give a few inſtances, out of a great many, that have

come to my knowledge, from which it will appear, how exceedingly great the damage muſt be throughout the extent of the kingdom.—

In the pariſh of Stevenage, in Hertfordſhire, there is a field of land well known in that neighbourhood, by the name of Chalkdell Field, containing about two hundred acres. The land in this field was formerly equal, if not ſuperior, to moſt lands in that county: in a word, it was good to a proverb. But lying conveniently for the ſurveyors of the roads, they have picked it ſo often, and ſtripped it of the flints and ſmall ſtones to ſuch a degree, that it is now inferior to lands, that were formerly reckoned not worth above one half its value, acre for acre. I mean ſuch lands, as lying at a good diſtance from the roads, have, for that reaſon, either not been picked at all, or not nearly ſo much as this field. All the farmers, and other perſons, who have known the field for a good number of years, and have obſerved the management, and produce of it, do unanimouſly declare, that the crops of grain from Chalkdell Field have not, for theſe laſt fourteen years, been much, if any, above half what they were the fourteen years immediately preceding, notwithſtanding the late improvements in huſbandry: and this is entirely owing, as they all agree, to ſtripping

ſtripping the land of the ſtones.—Nor is it Chalkdell Field alone, that has materially ſuffered in that county by the above mentioned practice: on the contrary, the oldeſt and moſt experienced farmers in the parishes of Gravely, Stevenage, &c. ſome of whom have been well acquainted with farming for upwards of thirty or forty years, and have in general lived always on the ſpot, do declare, and ſay, they are ready to attest it upon oath, if called upon, that ſeveral thouſand acres, bordering on the turnpike-road from Welwyn to Baldock in Herts, have been ſo much impoveriſhed by having the ſtones frequently taken away, that they are not now ſo good, as they would have been, had the ſtones been left upon the land, ſome by one-fourth; ſome by one-fifth; ſome more, ſome leſs, of their whole preſent value. But that all, in general, have been materially damaged, ſo that the loſs to the inheritance for ever, in the aforeſaid lands, muſt be computed at a great many thouſand pounds; to ſay nothing of what the public has ſuffered in the deficiency of the crops of grain.

But it may be aſked, if the damage by taking away the ſtones be ſo great as I repreſent; how comes it to paſs, that the farmers, who hold the afore mentioned lands, have not either broke, thrown up their farms, or got their rents lowered? None

None of which has generally happened. This I grant; but then let the very high price of grain for numbers of years paſt, and the famine of thouſands of ſtarving poor, anſwer theſe queſtions.—I am thoroughly convinced, that the high price of grain has been the principal reaſon; and a dreadful reaſon it is; why none of theſe has generally happened: and any one, who knows the progreſs of trade for thirty or forty years paſt, and the different quantities of money in that period, may ſatisfy to himſelf other concurrent circumſtances. What puts it beyond doubt, that this prodigious impoveriſhing of the land is owing to no other cauſe whatſoever, but picking and carrying away the ſtones, is, that thoſe lands have generally been moſt impoveriſhed, which have been moſt frequently picked: and ſo on in proportion. Nay, I know a field, part of which was picked, and the other part plowed up before they had time to pick it: the part, that was picked, loſt ſeven or eight parts in ten of two ſucceeding crops of grain: though the whole field was manured and managed, in all reſpects, alike. What proves inconteſtibly, that this almoſt incredible damage was owing ſolely to picking the ſtones, is, it went to an inch, as far as they were picked, and no further.—I ſhall mention but one inſtance more, at preſent.—A gentleman

gleman in the neighbourhood of Poulton, in Lancaſhire, who farmed a part of his eſtate, ordered the ſtones, which lay very thick on ſome grounds, to be carefully picked up, and carried away. He did this from an imagination, that they prevented the grain from growing out of the earth. Thoſe grounds had always before produced very good crops: but he now found, to his aſtoniſhment, that he could hardly get any crops at all. He aſked the neighbouring farmers, what they thought might be the reaſon of it; they were of opinion, it muſt be his cleaning the land of the ſtones; and adviſed him to carry them back, and ſpread them again all over the land: which he did at a great expence; He had excellent crops immediately: ſuch as the land had produced before the ſtones had been cleared away.—

Many perſons have been ready to imagine, becauſe nothing can grow upon a bare ſtone, that, therefore, it can be of no manner of ſervice to the corn, but rather the reverſe, in preventing it from growing freely out of the ground. But this concluſion is by far too precipitate: ſince ſtones are of ſurpriſing, and manifold uſes. For inſtance, they greatly aſſiſt the plough in working the land. They, alſo, prevent land of a binding quality, from running together; and hardening like mortar, in a

wall. They ſcreen the tender blade from blaſts and blights. They prevent the crop, where the ſtaple is thin, from being ſcorched up by the heat in ſummer: and they prevent the exudations of the earth from evaporating; and by that means greatly promote vegetation.

Should a doubt ariſe, whether the turnpike-roads, which are now mended chiefly with materials gathered from plowed lands, may be kept in as good repair as they are at preſent, without any conſiderable additional expence, if the power of gathering materials from plowed lands be taken away, let it be conſidered, that the beſt turnpike-roads in England are thoſe, which are intirely made with round pebbles, and ſuch other materials, as are dug from under ground: and, on the contrary, that thoſe, which are made chiefly with materials gathered from lands, are, generally ſpeaking, the very worſt. This is a circumſtance any perſon may be ſatisfied in, with very little inquiry. The turnpike-road from London to two or three miles beyond Hatfield, and thoſe from thence to Hitchin, if compared together, will furniſh a ſtriking inſtance of the truth of this obſervation. Therefore, ſhould there, in ſuch a caſe, be at firſt an additional expence, there can be no doubt, but that it will be more than compenſated for in the excellence, and duration

vation of the roads.—At the ſame time, I make this obſervation, I am not clear, that, upon the whole, there would be even at firſt an additional expence of any great conſequence. In ſome places, I believe, the reverſe would be the caſe. The above inſtances and obſervations are ſubmitted, and earneſtly recommended to the ſerious conſideration of the honourable Society of Arts, &c.

[redacted] moſt humble,

and moſt obedient ſervant,

Knelworth, Herts,
January 23, 1773.

R. PRICE.

Mr. *Gullet*'s Letter on Blights.

SIR,

EVERY member of the community, however diſtant from the metropolis, or private his ſtation, who knows any thing of your laudable inſtitution, which not only takes under conſideration, but encourages the propagation of every thing uſeful from the Cedar of Libanus, to the Hyſſop of the wall, muſt, if he be a friend to mankind, or a lover of his country, not only wiſh it well, but wiſh alſo to contribute ſomewhat towards the general good. It is

that, which occaſions my giving you this trouble; and, at the ſame time, makes me hope, you will pardon my preſumption, in ſending you the following obſervations on ſo ſeemingly trivial a ſubject.—Viz. *the preventing cabbage-plants from being eaten by caterpillars*; together with ſome reaſons why the ſame means ſeem capable of preventing blights, and their effects on fruit-trees, or others.—Theſe thoughts I have likewiſe extended in idea, to the preſervation of crops of turneps from the fly—alſo of crops of wheat from the yellows, and other deſtructive inſects. If theſe latter experiments ſhould ſucceed on trial, as I am ſtrongly inclined to think they will, then the ſame means, which produced theſe effects, may be extended to an almoſt infinite variety of caſes for the preſervation of the vegetable kingdom.

But *riſum teneatis amici*, how will you think you are inſulted, when I tell you, all this is to be performed with *a buſh of ſtinking elder*.—Great effects are frequently produced from ſeemingly trivial cauſes. Why may they not, in the preſent caſe.—Of the virtues of elder, in preſerving cabbages from being deſtroyed by caterpillars, I can already ſay, *probatum eſt*.—We all know, how very offenſive to the olfactory nerves, a buſh of green elder-leaves is. No body wiſhes to ſmell to it: becauſe it is ſo diſagreeable:

agreeable: and for that reaſon, every one avoids touching it. I conſider the olfactory organs of a butterfly as much ſuperior to ours, in delicacy and nicety, as their bodies are to ours.—If ſo, why ſhould not what is ſo offenſive to our ſmell be much more ſo to theirs? We often ſee them alight, and remain on cabbage-plants: but whoever ſaw them on a buſh of green elder?

Laughable as this experiment ſeems to be, I, however, determined to try it.—Accordingly I took ſome young elder-buſhes, the ſtems of which I held incloſed in a paper, that my hands might not ſtink of it, and whipped the cabbage-plants well with it, (but ſo gently as not to hurt the plants) juſt as the butterflies firſt appeared. After this, I never ſaw a butterfly come on them; nor was there, I believe, a ſingle caterpillar blown on any of the plants ſo whipped, during the reſidue of the ſeaſon. I could often obſerve the butterflies fluttering and hovering round the plants, (like gnomes or ſylphs) but never alight on them: although another bed of cabbage-plants, in the ſame garden, which had not been whipped, was infeſted, and eat by the caterpillars, as this had uſually been. I have tried the ſame experiment again this year, doubting not, but to have the ſame ſucceſs: and I ſhall be happy, if, (from its ſimplicity) your Society ſhould not think it beneath

heir notice; but take it under their patronage.

Reflecting on the effects of this experiment, and the cauſe which produced them; and thinking, that blights are chiefly and generally occaſioned by ſmall flies, and minute inſects, and that their olfactory nerves are as much ſuperior in delicacy to butterflies, as they are inferior in ſize; I whipped the limbs of a wall plum-tree, when in full bloſſom, as high as I could reach, with a buſh of young elder, whoſe leaves I had bruiſed, that the effluvia might be the ſtronger; and ſo as not to hurt the bloſſom. —The effects produced by this whipping are, that the leaves of theſe limbs are very green, freſh, ſmooth, and flouriſhing: the fruit hath ſet very fair, thick, and thriving: and there is not the leaſt appearance of a blight on any of the limbs ſo whipped: while thoſe not ſix inches higher, and from thence to the top of the tree, are blighted, and ſhrivelled up as uſual; and, as thoſe of this tree had been for ſeveral years paſt; and not one third ſo much fruit ſet on the unwhipped part, as on the limbs whipped: though the bloſſom was equal: and there is more fruit promiſing to ripen this ſummer, on the two limbs whipped, than hath been on the whole tree for three years paſt.—I have ſince endeavoured to reſtore one of the blighted ſhoots, by whipping the leaves,

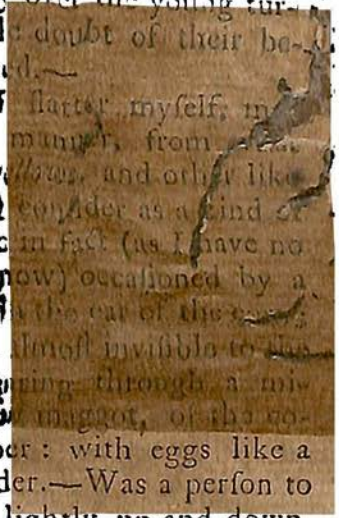
leaves, and tying up a twig of elder among them: which hath in part, had the deſired effect, by the offenſive effluvia driving away the flies.—By this means, thoſe leaves have revived, which were not abſolutely rolled up in a ſcrowl, where the inſects are out of harm's way; and the ſmell of the elder.—I have tried the like experiment on another tree with the like ſucceſs.

This has ſuggeſted a thought, whether the elder-plant, now eſteemed noxious, and offenſive, may not be one day ſeen planted with, and entwining its branches among fruit-trees, in order to preſerve the fruits:

I ſtruck over a bed of young cauliflower-plants, which had been bit, and almoſt deſtroyed by inſects, (either fleas, or flies) with an elder-buſh: ſince which, they do not appear to have been touched, or hurt, but are recovering a-pace: and I promiſe myſelf, they will not be infeſted again with any ſorts of inſects, unleſs ſome can be diſcovered fond of living on elder-leaves.

This circumſtance hath determined me to try the following experiment on a crop of young turneps, (which I am about to till.) When they come up to the height at which they are uſually eat, and greatly damaged by inſects of ſome kind or other, (either flies or fleas) I intend to let a man draw a buſh or two of elder, ſpread ſo as

to cover the breadth of a ridge at once, up and down ſmoothly over the young turneps: and I have little doubt of their being effectually preſerved.—



Crops of wheat, I flatter myſelf, might be preſerved, in like manner, from what the farmers call the yellows, and other like accidents: which they conſider as a kind of mildew; but which is in fact (as I have no doubt but you well know) occaſioned by a ſmall fly, that blows in the ear of the corn, and produces a worm almoſt invisible to the naked eye, but appearing through a microſcope a large yellow maggot, of the colour and gloſs of amber: with eggs like a very fine yellow powder.—Was a perſon to draw an elder-buſh lightly up and down, over a ridge of corn, when the ears are firſt formed; and before thoſe flies have blown: I have little or no doubt, but the parent inſects would be effectually deterred, and prevented from pitching their tents in ſo noxious a ſituation.

As theſe thoughts, and the length I have extended them to, in a variety of other caſes in my own imagination, have afforded me ſome pleaſure, I truſt you will pardon my troubling you with them,—when I aſſure you, that, though the baſis of this ſubject is only a ſimple buſh of ſtinking elder, yet the communication of it is meant as a proof of that reſpect, which, as a member of

of the community, I owe to ſo truly laudable an inſtitution, and is intended (however it may be received) *pro bono publico*.

I have the honour to be, Sir,

Your moſt humble ſervant,

Taviſtock, Devon,
4 June, 1771.

CHRIS. GULLETT.

P. S. Since writing the foregoing account, I have obſerved, that the ſame cauſe is the deſtruction of great part of our apple-bloſſom; and, could the above method of whipping our apple-trees take place, I have little or no doubt of its contributing eſſentially to the increaſe of our cyder-bearings. For, allured by the fragrancy of the apple-bloſſom, or guided by inſtinct, or both, not only a ſmall black fly produces ſwarms of young ones, in the leaves, which contract, ſhrivel, and blight them: but they, or ſome other flies, blow alſo into the bloſſom: which produces a white maggot, in conſequence of which, the bloſſom is contracted, ſhuts itſelf cloſe round the worm, and forms a complete covering to it, like a ſhell; where it continues devouring the heart of the bloſſom till that is effectually deſtroyed, and turned to a yellowiſh red colour, like a dried dock-leaf.

Mr.

Mr. *Bullett*'s ſecond Letter on Blights.

SIR,

YOUR obliging letter, of the 20th inſtant, in conſequence of mine of the 4th ultimo, gives me pleaſure, as well as confers an honour upon me, which I was apprehenſive the ſimplicity of my ſubject would ſcarce intitle me to; and therefore demands, and you have, my thanks, ſir, for the early notice, you have been pleaſed to take of it, and your promiſe of laying it before the Society.—I was, and ſtill am doubtful, whether you meant to have an immediate anſwer to your queries, or at any time before your next meeting in October: but concluded upon the whole, it was better to err in ſhewing my over-readineſs, than the leaſt backwardneſs to enter on a correſpondence with ſo worthy a Society of literati, which would do me ſo much honour; more eſſentially, as I think with you, that the ſubject under conſideration may be of public utility; which, I conſider as the baſis of your inſtitution, and which ſhould animate every individual to encourage it. Therefore, as the poor widow threw her mite of money, into the public treaſury of riches, ſo do I my mite of obſervation into your Society, the public

lic treaſury of uſeful arts, and the great promoter of commerce: and which hath ſo largely contributed to that aſcendency this kingdom is gaining over the reſt of Europe in theſe ſeveral branches.

The elder, I made uſe of was the *ſambucus fructu in umbella nigro*, the common hedge-elder. But then it was ſolely of the young ſhoots of this laſt ſpring: which, at that time, ſmelled much ſtronger, and more offenſive than they do at preſent, when arrived at their bloſſoming ſeaſon. For the rind, or outer ſkin, of the ſhoots of this year, is now much thicker than when I uſed them; and conſequently, leſs permeable to the juices, which are now become more viſcid, beginning to loſe their fluidity, and to acquire an arborical quality.—The large ſtems of elder, which are covered with a thick rough cortex, do not, I apprehend, give any ſtrong ſmell: and the expreſſions in my former letter were meant to be confined ſolely to young elder-twigs, or ſhoots of this ſpring only. The dwarf kind of elder, mentioned in your letter, which botaniſts, I apprehend, call *ebulus*, being more offenſive than the young ſhoots of common elder, muſt undoubtedly be much preferable to it; by ſo much, as the ſmell is more offenſive. Since all the virtues, I attributed to elder, are derived merely from the ſtrong, ill-flavoured, diſagreeable

disagreeable effluvia, it emits:—of which, I apprehend, it loses considerably, the nearer it approaches to its blossoming state; as the blossom in particular scarce retains any of the genuine flavour.—I do not remember to have seen the bulbs.

Since my last letter, I have been informed of the following fact, which seems to corroborate my hypothesis, viz. that, when this county was infested with such swarms of cock-chafers, or oak-webs, about eight or nine years ago, in many parishes, like the Egyptian locusts, they eat up every green thing, but elder: and there was scarce a green leaf left unless on the elder-bushes. I have been credibly assured, that they remained untouched, amidst the general devastation; which can only, I think, be accounted for from their unpalatableness that must certainly be great, to occasion their escaping so voracious a multitude.—

As the farm, I keep, in hand is at some distance from this town, I ordered my hind to be sure to draw an elder-bush over the wheat-fields, as I mentioned in my last, as soon as the corn was eared; and before it began to blossom: but the very dry, hot weather bringing on the corn sooner than was expected, I was surprised, and greatly vexed, on taking a ride thither one day, to find it got and getting into fine blossom.—I, however, ordered, and accordingly next morning

morning at day-break, two ſervants went with two elder-buſhes on each ſide the ridge, from end to end, and ſo back again; and drew them over ſuch of the fields, as were not got too far in bloſſom. Theſe I examined laſt week; and found pretty clear of the yellows, much more ſo than thoſe which was not elder-ſtruck. And I have little doubt, but that had the operation been performed ſooner, it would have totally prevented their being at all touched. —But the evening before they were ſtruck, in going through the fields, and looking attentively at the ears of corn, I diſcovered vaſt numbers of the flies, which occaſion the damage, already on the corn, ſeven or eight flies on a ſingle ear. Therefore I have no doubt, but that the eggs of the yellows, which are there now, were lodged before the corn was ſtruck with the elder: as prevention, and not cure, is all to be expected from the operation.—I took notice of the manner of the flies. They are of about the ſize of gnats, with a yellow body, and blueiſh wings, depoſiting their eggs; which they do on the outſide of the huſk of the ear about the upper, or middle part of the huſk: from whence, I ſuppoſe, they deſcend into the huſk by the next ſhowers of rain, or dews. One fly in particular, I ſaw, lay a great number of eggs after the

rate

rate of about one egg every second of time, till at length, I caught her by the wing; and, in carrying her only across three or four ridges, I thought I perceived something on my thumb, which I took up; and, on viewing it through a pocket-microscope, found it to be at least eight or ten eggs, of an oval form, which she had laid in that time; and which, I preserved for some time, and shewed to several people.—Judge then of their fecundity.—As a further proof of which, I will inform you, that the day I received your letter, I examined some corns of one ear, and found the following numbers of living yellow maggots, or insects in the husk of one single grain, viz. in the first corn fifteen, in the second nineteen, in the third twenty-nine, and in the fourth forty-one.—So large a number, as forty-one insects, in one single grain, seems sufficient to eat up all the corn in a whole ear: and we must suppose, either that, like the Northern nations of old, or modern Arabs, when they have consumed all their old stock, they decamp in search of more: or that they are starved and perish in their citadel. This last seems the most likely: as, first, it appears difficult for them to get out; and, next, should such innumerable multitudes all survive, or did not innumerable multitudes perish, they would threaten

us

us with an entire deſtruction of the next wheat-harveſt.

I am much obliged to you for the opportunity you have afforded me, of repeating my reſpects for your laudable Society, and ſubſcribing myſelf, as with great truth I am,

Your obliged,

and obedient ſervant,

Taviſtock,
27 July, 1771.

CHRIS. GULLETT.

ARTICLE

ARTICLE VIII.

Certificates, with Accounts of the reſpective Culture and Cure, ſent in Claim of the Premiums, offered by the Society for the Encouragement of Arts, Manufactures, and Commerce, *for the greateſt Quantity of* MADDER *produced on one Acre; inſerted at the Requeſt of the Society.*

To *Robert Doſſie*, Eſq.

SIR,

I Am directed by the Society for the Encouragement of Arts, Manufactures, and Commerce, to deliver to you the ſeveral certificates, with the reſpective accounts of the culture, cure or preparation, ſent to them in claim of their premiums for the greateſt quantity of madder produced on one acre*; in order to their being inſerted in

* The Society, among the other means, by which they endeavoured to introduce, and extend the culture of madder in our country, have offered, during a number of years, premiums for producing the greateſt quantity of that root from one acre of land: an account being given, by the claimant, of the reſpective manner of culture. The intention of theſe premiums was, not only to incite endeavours to improve the methods then in uſe of cultivating, and preparing madder; but to obtain the means of ſpreading more extenſively by the knowledge of the

in the Memoirs of Agriculture, if you think proper.

I am, Sir,

Your very humble ſervant,

SAMUEL MORE, ſec.

the beſt of theſe methods: which are known, in our country, only to a very few.

Theſe premiums were, till the year 1767, twenty pounds offered at large, without any reſtriction, *for the greateſt quantity raiſed on one acre*: the candidates giving an account of the manner of culture.—But, in 1768, the ſum of twenty-five pounds was offered to the perſon who ſhould produce the greateſt quantity of dry and clean roots, not leſs than forty hundred weight, from one acre:—fifteen pounds for the next greateſt quantity, not leſs than thirty hundred weight:—and ten pounds for the next greateſt quantity, not leſs than twenty hundred weight:—the claimants giving an account of the method of curing as well as cultivating the madder.

In 1772 the terms of theſe premiums were further changed: and the ſum of twenty-five pounds, or the gold medal was offered to the perſon, who ſhould produce the greateſt quantity of madder, properly prepared for the uſe of manufacturers, not being leſs than thirty-two hundred weight: ſpecifying the different ſorts into which it ſhould be divided; and the quantity of each ſort: a full account being alſo required of the culture, and preparation.

It was in conſequence of thoſe ſeveral premiums, theſe certificates, and accounts were ſent to the Society.—It is not propoſed, by the publication of them, that the methods they deſcribe, ſhould be underſtood to be recommended as proper to be adopted in general: as leſs laborious and expenſive modes of culture may be more ſuitable in many caſes to the circumſtances of the cultivator, and the ſoil; and anſwer as well on the whole, with reſpect to the profit. But the knowledge of thoſe means, by which the greateſt crops of madder have been obtained,

Mr. *Crow*'s Certificate of planting Madder, with an Account of the Culture and Cure. 1771.

Feverſham, Jan. 1ſt, 1771.

THESE are to certify, that John Crow, of the pariſh of Feverſham, in the county of Kent, hath dug up, from one acre and eight perches of land in the pariſh of Feverſham, late a hop-ground, of —— Lawſon, eſq. adjoining to a lane, called Hangman's Lane, thirty-two hundred weight one quarter of a hundred, and twenty-four pounds of dried and cleanſed madder-roots: of which, he hath ſent a ſample of ſeven pounds weight; which is the ſame in quality as the whole parcel. The above madder is three years growth, and no more.

Signed

RICHARD MARSH, Vicar of Feverſham.
JOHN CRESWELL, } Church-wardens.
THO. MORRIS, }
JOHN CROWE.
JOHN CORNE.
JOHN PRATT.
HENRY ANDERSON.

being thus ſupplied, an opportunity of adopting them as far as they may be expedient in the particular caſes, is furniſhed to the leſs ſkilful cultivator, who might, otherwiſe, not only be ignorant of them; but, in many inſtances, deſtitute of the power to procure ſuch information.

Me-

Method of Cultivating the Madder.

After ploughing the land twice, and harrowing and rolling it ſeveral times, till it was fine and clean, I then plowed it again with a foot-plough, or what I call a trench plough, which goeth twice in a furrow, and turns the ſecond furrow quite upon the firſt. In going twice, I can plough the ground fourteen inches deep, by cutting the ground in two furrows. It is much lighter and finer than if I had plowed the ſame depth at one furrow: and three horſes did the work with eaſe. Whereas, if I had plowed the ſame depth, with once plowing, I muſt have had ſix or eight horſes.—After I have plowed it in the above manner, I never ſuffer a horſe to go upon it. I dreſs it down with a garden-rake. The ground cannot be too fine or light for madder.—Then I plant my madder in beds, in the ſame manner as gardeners plant aſparagus; and earth it up in the ſame manner. Earthing it up keeps the ground clear, and makes good plants. The madder growing through the freſh earth, ſtrikes full of young roots, or fibres: which makes the plants certain of growing. Without earthing it up, the plants in drawing up would break off like a crabs-claw

without any roots: ſo that half of them would not grow: and thoſe that did, would make but little progreſs: which has been the reaſon, we have no better crops in England.—I always plant upwards of thirty thouſand plants per acre: whereas the method has been to plant but fifteen or twenty thouſand. When the ground is quite furniſhed, the madder keeps itſelf clean. The beſt method, that I can find out in planting madder, is to make the land clean, fine, and deep; to put in good plants; and to keep it clean the firſt year. It will keep itſelf clean after the ground is covered.

Method of Curing the Madder.

After I had dried it, as much as poſſible in the fields, and ſhaken off the dirt as much as poſſible, I houſed it.—Then I let it lye about eight or ten days, and every other day turned it, till I had got it as clean as I could, I then dried it on a hop-oaſt, till it was cured. I afterwards threſhed it on the floor, till the dirt was quite beat off. Then, with forks and rakes, got off the longeſt, which was quite clean. Then I caſt all the ſhort madder, and dirt acroſs the floor. The lumps of dirt and ſmall ſtones flew to the further end of the floor; and the madder dropt ſhort. Then, with a coarſe ſieve, I got out the beſt of

the madder, and finiſhed it, with a fine ſieve, in the ſame manner as wheat or other grain.—

Mr. *Crow*'s ſecond Certificate of planting Madder: with an Account of the Culture and Cure. 1771.

Feverſham, November 14th, 1771.

THIS is to certify, that I, John Crow, in the pariſh of Feverſham, in the county of Kent, have dug up, from one acre and two perches of land, in the pariſh of Feverſham, in a field called Cutthorn, thirty-three hundred, one quarter of a hundred, and twenty pounds of dry and clean madder-roots: of which, I have ſent a ſample of ſeven pounds; that is of the ſame quality as the whole parcel. Witneſs my hand,

JOHN CROW.

N. B. The above madder is three years growth, and no more.

Witneſs to the truth of the above certificate.

RICHARD MARCH, Vicar of Faverſham.
JOHN CRESWELL, } Church-wardens.
THO. MORRIS, }
Jos. JOACHIM, Mayor of Feverſham.
EDWARD JACOB.
J. BRICK.
JOHN CORN.
HENRY ANDERSON.

The Method of Culture.

The land was old hop-ground, which I dug up for that purpoſe:—then I plowed it with what we call a foot-plough, or trench-plough, which goes twice in one furrow; and turns the ſecond furrow quite upon the firſt. In going twice in one furrow, I plowed it fourteen inches deep. Then, inſtead of harrowing it with horſes, I dreſſed it down with garden-rakes, and planted it with winter-ſets, in the months of October and November; which I prefer to ſummer-plants for two reaſons. Firſt, I think they produce a better crop: and ſecondly we rob our crops greatly by taking off the plants in the ſpring.

The Method of Cure.

After I had dried it, as much as poſſible, in the field, and ſhaken the dirt out as much as poſſible, I houſed it, and dried it on a hop-oaſt. I then threſhed it on the floor; and ſhook it with forks, and rakes, till I got off all the longeſt quite clean.—Then I caſt it acroſs the floor, and the lumps of earth, and ſmall gravel ſtones, flew to the further end; and the madder dropt ſhort. Then, with coarſe ſieves, I ſifted out the longeſt: and with ſeveral ſorts of ſieves, ſome finer than the other, I finiſh it like wheat, or other grain.

Mr.

Mr. *Crow*'s Certificate of planting Madder: with an Account of the Culture and Cure. 1772.

Feverſham, October 31ſt, 1772.

THESE are to certify, that I, John Crow, of the pariſh of Feverſham, in the county of Kent, have dug up, from one acre, and one perch of ground, fifty-one hundred, one quarter, and twenty-ſix pounds of dry and clean madder-roots: of which, I have ſent a ſample of ſeven pounds weight, of the ſame quality of the whole parcel. Witneſs my hand,

JOHN CROW.

N. B. The above madder was three years growth, and no more; and grew in a field known by the name of Cutthorn, in the pariſh aforeſaid.

Sworn before me, the day and year above written.

EDW. JACOB, Deputy Mayor of Feverſh.

Sworn before me,

RICHARD LUSHINGTON, Mayor.

The above madder was weighed in our preſence, viz.

RICHARD MARSH, Vicar of Feverſham.
JAMES TAPPENDEN, Attorney at Fev.
JOHN CRESWELL, } Church-wardens.
THO. MORRIS, }
HENRY ANDERSON.
JOHN BALDWIN.

Method of Cultivating the Madder.

The ground was old hop-ground, that had been well manured for many years. After the hop-roots were dug up, I plowed it with a foot-plough, that goes twice in one furrow; and, by that means, turns the laſt furrow quite upon the firſt; and, in going twice in a furrow, it cuts the ground much finer than if I had plowed the ſame depth in one furrow: which was about fourteen inches deep. Then I harrowed it with horſes; and made it very fine. But as I was afraid, the horſes feet had cloſed it too much, I was at the expence of diging the bed, where the madder was planted with three-pronged ſpuds, the ſame we dig the hop-grounds with: and I dug it as deep as the plough had been before. Then I dreſſed it down with garden-rakes very fine; and ſtreched a line over the middle of the beds; and then, with a heavy rake, the head made of a piece of wood, ſix inches ſquare, with four teeth made in the form of a wedge, about ten inches aſunder. This rake is drawn by a man over the bed, and leaves four ſmall furrows, or marks, for the men to plant by: and the plants ſtand very ſtrait and regular. Then, by hoeing and hand-weeding, I keep it clean all the ſummer; and, in November, begin

to

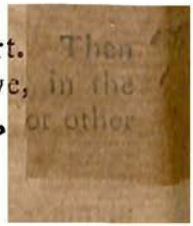
to earth it up in the ſame manner the gardeners do their aſparagus; and, at the beginning of March, dreſs it down in the ſame manner with garden-rakes: earthing it, keeps the ground clean, and makes good plants. There is no getting good plants without earthing.

N. B. The above madder was ſo ſtrong, I was obliged to dig three ſpades depth, to get it up, at thirty pounds expence.

Method of Curing the Madder.

After we have cleanſed it, and ſhook the dirt out, as much as poſſible in the field, we houſed it; and keep it turned every day: and every time it is moved, we loſe ſome dirt. Then we dry it on a hop-oaſt: which is a very convenient place for the purpoſe. While it is drying, the man often treads it all over; which breaks the dirt, that is between the roots: and we often keep it turned and ſhook up. When it is dry enough, it will crap like a piece of tobacco-pipe. Then we get it off: and with forks and rakes, we beat it on the floor, till it is quite clean. Then, with a coarſe rake, we get off the long: and the ſhort madder, and dirt we caſt, in the ſame manner as wheat; and the lumps and ſmall ſtones fly to the further end of the floor;

floor; and the madder drops ſhort. Then we ſift out the dirt with a fine ſieve, in the ſame manner as we cleanſe wheat, or other grain.



Mr. *Walker*'s Certificate of planting Madder, with an Account of the Culture and Cure. 1772.

Feverſham, October 31ſt, 1772.

THESE are to certify, that I, George Walker, of Faverſham, in the county of Kent, have digged up, from one acre and four perches of land, in the field called or known by the name of King's Field, in the ſaid pariſh, adjoining to the London-road, twenty-ſeven hundred weight, three quarters of a hundred weight, and eighteen pounds of dry and clean madder-roots, of three years growth: of which I have ſent a ſample of ſeven pounds weight, of the ſame quality as the whole parcel.

GEO. WALKER.

Sworn to the truth of this certificate, by John Crow, who was employed in digging up, and drying the above madder, before me, the day and year aforeſaid,

JOHN CROW.

Sworn

Sworn before me,
EDW. JACOB, deputy Mayor of Faverſh.
RICH. LUSHINGTON, Mayor.

The above madder was weighed in our preſence.
RICHARD MARSH, Vicar of Feverſham.
JAMES TAPPENDEN, Attorney at Fev.
JOHN CRESWELL, } Church-wardens.
THO. MORRIS, }
HENRY ANDERSON.
JOHN BALDWIN.

Method of Cultivating the Madder.

The land was firſt plowed with a foot-plough, twice in one furrow. The ſecond time turns up the earth upon the firſt: by which method, it turns up the land about fourteen inches deep; and is much finer than if it had been plowed the ſame depth at once: then it was harrowed down very fine with horſes. But harrowing with horſes treads down the land too cloſe to plant after. Therefore, I had the land dug in the beds, where the madder was to be planted with three-pronged ſpuds, ſuch as we generally dig our hop-ground with. Then I had it dreſſed down very fine with garden-rakes. Then a line is ſtretched over the middle of the bed, for a guide for to draw a rake by.—The rake is made as follows

follows. The head is made of a piece of wood ſix inches ſquare, in which is four ſquare teeth, about five inches long, and ten diſtant from one another. This rake is drawn by a man over the beds, by the line: and the teeth make four ſmall furrows to plant the plants regular, and ſtrait by. Then it is kept clean by hoeing, and hand-weeding in the ſummer. In November, I had it earthed up, by digging two ſpit wide between the beds: one ſpit is laid on the right-hand bed; and the other on the left; and, in March, I had it dreſſed down very fine with garden-rakes; ſo that the beds muſt reſemble aſparagus-beds.—The earthing up the beds is of great ſervice in raiſing good plants: for, without earthing, the plants would have little, or no fibres.

Method of Curing the Madder.

The above acre of madder was dried by Mr. Crow, in the ſame manner as he has dried his own madder*.

* Mr. Crow's method of cure is explained in the preceding and following certificates from him.

Mr.

Mr. *Crow's* Certificate of Planting Madder, with an Account of the Culture and Cure. 1773.

Feverſham, November 1ſt, 1773.

THESE are to certify, that I, John Crow, of the pariſh of Faverſham, in the county of Kent, have dug up from one acre of land, in a field called Cutthorn, in the pariſh of Faverſham aforeſaid, twenty-ſeven hundred weight, a half hundred weight, and thirty-three pounds of dry and clean madder-roots; of which I have ſent a ſample of ſeven pounds; that is of the ſame quality as the whole parcel.—The above madder is three years growth, and no more.

JOHN CROW.

Feverſham, November the 1ſt, 1773.

I certify, that John Crow hath made oath before me this day, that the above certificate is true.

EDW. JACOB, one of his Majeſty's Juſtices of the ſaid Town.

RICHARD MARSH, Vicar of Feverſham.

THOMAS GIBBS, } Church-wardens.
HENRY JONES, }

THO. BENNETT,
JOSEPH PERKINS,
GEO. WALKER.
HENRY ANDERSON.
JOHN GREGORY.
JOHN CRESWELL.

The Method of Cultivating the Madder.

The land had been hop-ground for many years; and, in digging the hop-roots up, I dug the ground two ſpades depth, which made a good ſeaſon for madder.—Then I dipt the plants in mud-water, as thick as batter, which keeps them from withering, even in the drieſt weather.—

The Method of Curing the Madder.

After the madder is dry in the field, and the dirt ſhaken out as much as poſſible, I houſe and dry it on a hop-oaſt, till it be cured.—Then I threſh it on the floor, till the dirt be all beaten out.—When I caſt it acroſs the floor, and the ſmall lumps of dirt, &c. fly to the farther end of the floor, and the madder drops ſhort. After this, with a fork and rake, I get off the longeſt: and the ſhort madder, I clean with ſieves, in the ſame manner as wheat, or other grain.

JOHN CROW.

Mr.

Mr. *Crow*'s Certificate of the planting Madder, with an Account of the Culture and Cure. 1774.

Feverſham, 1774.

THESE are to certify, that I, John Crow, of the pariſh of Feverſham, in the county of Kent, have dug up, from one acre and one perch of land, in the pariſh of Milton, near Sittingbourn, in the county of Kent, eighteen hundred weight, half a hundred weight, and eighteen pounds of madder *, manufactured, and fit for the dyer's, or printer's uſe. I have ground it into two ſorts, crop, and umbro. Of the firſt ſort, there is ſeven hundred weight, one quarter of a hundred weight, and eighteen pounds; of the latter, there is eleven hundred weight and one quarter of a hundred weight: of which I have ſent a ſample of two pounds weight of each ſort, according to the advertiſement.

JOHN CROW.

* The quantity of madder is *nominally* here much leſs than in the preceding certificates. But the reaſon is, this was weighed, and computed in a different ſtate: having undergone the ſubſequent preparation neceſſary to render it fit for the uſe of manufacturers, according to the change of the terms made in the Society's advertiſements, in 1772, (as before mentioned in the note, page 177) inſtead of being only dried and cleanſed as was required before.

Witneſſes

Witneſſes to the above certificates,

THO. LAMPREY, Curate of Milton aforeſ.
THO. QUESTED, } Church-wardens.
EDWARD CRISFIELD, }
JOHN BLACK, } Overſeers.
THO. PACKENHAM, }
JOHN WOOD, Surgeon.
HENRY ANDERSON.

The Method of Culture.

The land had been hops for many years, which I dug up: and I plowed it with a common plough, only about ſix inches deeper than we plow for corn. Then, inſtead of harrowing it with horſes, it was dreſſed down with a hand-harrow, and garden-rakes, &c. The ground being very fine and clean, I planted the madder-roots in beds,—in the ſame manner the gardeners plant their aſparagus. The beds were five feet and a half each bed: and thirty thouſand plants to the acre. The weeds were kept out by hoeing, and hand-weeding in the ſummer: and, about November, the plants were earthed about five inches deep. In March, the beds were dreſſed down, with a garden-rake, in the ſame manner as aſparagus. In ſummer we hoed and hand-picked the weeds, as before: and in November we earthed again, and in March dreſſed it down with garden-rakes, as before;

fore; with hocing and weeding in the ſummer as above deſcribed; and now it is juſt taken up, ſo its three years growth, and no more.

JOHN CROW.

The Method of Cure, and Preparation of the Madder.

After the dirt, or earth, is got out as clean as poſſible in the field, I houſe it, and ſhake it from one end of the building to the other, till the dirt is out as clean as poſſible.—Then I dry it on a hop-kiln, or oaſt, till it will crapple like a piece of tobacco-pipe; and till that, it is not cured. When we find it properly dried, we throw it out of the kiln, or oaſt, on the floor, and threſh it; and beat it to pieces with the back of a rake, till it is pretty ſmall. Then, with forks and rakes we get off the longeſt: and the dirt, and ſmall pieces of madder, we caſt acroſs the floor, as we do wheat, or barley: and the lumps of dirt, and ſmall ſtones, fly to the further end of the floor; and the madder drops ſhort. Then, with ſieves, we get out the duſt, as we do from wheat, or barley.

Though the roots have been dried before, they will not grind, when they become cold again: but they muſt be dried again, till they crapple under foot like ſo

many tobacco-pipes. Then we put the roots under the ſtones, till we have ground it enough, to get off all the outſide peel, or till the biggeſt half will go through the dreſſing-mill, or ſieve. We put the other under the ſtones again; and when that is ground, and dreſſed, we call it crop madder.

JOHN CROW.

ARTICLE

ARTICLE IX.

Account communicated to the Society for the Encouragement of Arts, Manufactures, and Commerce, *of the eſtabliſhment of a Botanical Garden at Saint Vincent's, by Dr.* YOUNG:—*Certificate of a Production of a Sample of Indigo, on the Plantation of* HENRY STRACHEY, *Eſq. in Eaſt Florida, with an Account of the Culture and Proceſs: Account of the Culture and Preparation of a Sample of Rhubarb raiſed by Sir* ALEXANDER DICK: *and a Certificate of the Production and Preparation of a Sample of Rhubarb, by Mr.* CALLENDER; *ſent in Claim of the reſpective Premiums: inſerted at the Requeſt of the Society.*

To *Robert Doſſie*, Eſq.

SIR,

I Am directed by the Society for the Encouragement of Arts, Manufactures, and Commerce, to deliver to you a letter from Dr. *Young*, on the eſtabliſhment of a botanical garden at Saint Vincent's: a certificate reſpecting indigo, made in Eaſt Florida, with the proceſs: a letter from Sir *Alexander Dick*, on rhubarb raiſed and

prepared by him; and a certificate from Mr. *Callender* of his production of rhubarb; in order to their being inſerted in the Memoirs of Agriculture, if you think proper.

I am, Sir,

Your very humble ſervant,

SAMUEL MORE, ſec.

Doctor *Young*'s Letter on the Botanical Garden eſtabliſhed in the Iſland of Saint Vincent.

SIR,

THE Society being now met for the diſpatch of buſineſs, I beg leave to trouble you with a ſhort hiſtory of a botanic garden, I have been endeavouring to eſtabliſh in the Weſt Indies; of which, their propoſals for provincial gardens, gave me the firſt hint.—To this was added, as a farther inducement for my undertaking a ſcheme of this kind, the Society's promiſe to give premiums for the more extenſive production of thoſe articles raiſed in ſuch gardens, which may be uſeful to the trade and commerce of Great Britain.

Being appointed, in the year 1764, ſurgeon to the hoſpital for the ſervice of his majeſty's troops in the Iſland of St. Vincent, I was placed in a proper ſituation for

putting

putting in execution the above plan. Another incident, ſtill more fortunate, was, general Melville's being appointed governor of the Southern Caribbee Iſlands.—He, being a member of your Society, a lover of botany, and a man diſpoſed to encourage every undertaking that may tend to public utility, promiſed to procure a ſpot of land for a garden, provided I would take care of it.—Accordingly twelve acres of good land were ſet apart for a botanic garden: in which, plants, that are the ſpontaneous growth of the iſlands, and whoſe uſes are already known, as well as thoſe whoſe uſes we are ignorant of, until farther experiments are made, may be cultivated; and where thoſe, that are neither of the growth of Great Britain, nor of her colonies, but of other warm climates, and which we are obliged to take from foreigners, may be raiſed.

For the firſt two or three years, little elſe was done, but clearing and fencing in the ground. As ſoon as this was finiſhed, I turned my thoughts to the introducing of ſuch articles as the Society had offered premiums for; as well in order to obtain theſe to enable me to go on with the plan, as to promote the views of the Society.—

Amongſt other premiums, there was one for logwood. I endeavoured to get the ſeeds of it; but before I did, the time limited

mited for the premiums was expired. Now I have many thouſands of the plants: nay the very hedges, with which the botanic garden is fenced in and divided, conſiſt of logwood.

Safflower too is another thing, I was too late in getting. It grows very well: and I have ſtill a little ſpot planted with it, in caſe it ſhould be thought neceſſary to extend that cultivation.

The Guadaloupe cinnamon was another article, which the Society wanted to be introduced into our iſlands. I repeatedly wrote to Guadaloupe for ſeeds or plants; as did, likewiſe, his majeſty's commander in chief of theſe iſlands. We were as often promiſed them; but, by the year 1768, I had got only two plants. In May, 1770, I was at the expence and trouble of going to Guadaloupe myſelf, in order to procure them in greater quantitities.—I obtained ten more, at an expence of about eight pounds ſterling.—Although I paid no freight for the veſſel I went in; being the commiſſioner's ſloop.—In the year 1771, I procured, from a tree in Granada, about twelve hundred ſeeds, from which I raiſed about one hundred and thirty plants: which, with what I had before, make up one hundred and forty: and for which I have a certificate herewith from Mr. Sharpe, the preſident of his majeſty's council in St. Vincent,

cent's, (the lieutenant-governor being abſent.) Although all of them were not introduced before the expiration of the time for obtaining the premium offered by the Society, yet ſome of them were; and the reſt ſoon after.

In my peregrinations, among the iſlands, I diſcovered, in Dominique, three trees of the Guadaloupe cinnamon, which ſome curious Frenchmen had planted there; and, in Granada, four, in different parts of the iſland.—Although there are but three now. For a man of no curioſity cut one of his down. A ſecond had like to have ſhared the ſame fate, had not a friend of mine interfered. He told the proprietor, that he would pay him double the value of the coffee it ſpoilt him, (for it ſhaded a few coffee-buſhes, and prevented their bearing ſo much, as they might otherwiſe have done). It was, from this laſt tree, that I produced the twelve hundred ſeeds, above mentioned.—Now, that I know the time of the year, in which theſe trees ripen their ſeeds, and that I can have leave to gather them; being alſo better acquainted with the method of raiſing them than heretofore; I think, that, on my return, I can rear whatever numbers of them the Society ſhall chooſe.—

Beſides the articles, for which the Society have offered premiums, many other,

not leſs uſeful plants, have been introduced in the Iſland of St. Vincent. That the Society may ſee them at one view, I ſhall here enumerate the whole, viz. cinnamon; logwood; ſafflower; turmeric; Eaſt-India mangoe; ſcammony; colocynth; rhubarb; the Tobago nutmeg; ſimarouba: ſpigila, or worm-graſs; citron; bergamot; bamboo; Italian ſenna; aloes; coriander; aniſe; vanelloes; morus papyrifera, or the tree from which the Chineſe make their paper; nopal, or that ſpecies of prickly pear, on which the cochineel-fly feeds, and I am in hopes of getting thoſe inſects; balſam capivi; ſeſamum; caſſia fiſtularis; dates; rocou, or annotto; lignum vitæ; China root; gum galbanum; and of one kind of the tallow-tree, one plant. Beſides theſe articles, there are ſeveral without names, that have been raiſed from Chineſe, and other ſeeds.

There is, likewiſe, a very great number of plants, natural to the country, growing in the gardens: which perhaps are only curious to a botaniſt. If any members of the Society deſire a liſt of them, he may have it at any time.

The following ſeeds, I ſhall be able to carry out with me in ſpring, viz. ſeeds of the gardenia, which, I am told, are a ſcarlet-dye; tallow-tree; Alexandria ſenna; rheum kibes; poppy-ſeeds; elaterium; mango-

mango-ſteen; upland, or dry rice; gum ſeneka; oily palm-trees; cheſnuts; walnuts; mulberries.—I, ſhall, alſo take the following from the royal, and other botanic gardens in and about London, viz. tea-ſhrub; ſago; palm torex; caſſine, or South Sea tea; ciſtus labdanifera; tacamahac; Succotorine aloes; manna-aſh; almonds; olives; cork-trees; camphire-tree; gadenia plants; ſtaves-acre; lichen, &c.

There are other things, beſides theſe laſt mentioned, which I would wiſh to have; ſuch as cloves; nutmegs; black pepper; long pepper; the different kinds of caſſias, and cinnamon. Although the Guadaloupe cinnamon is looked upon, by very good judges, to be the ſame as that of Ceylon*, yet,

* With reſpect to the cinnamon-trees found in the Weſt Indies, being the ſame as thoſe of Ceylon, doctor Solander has given his opinion as follows, in a letter to doctor Young, on his having conſulted him on that point.

"I am very much obliged to you for the opportunity "you gave me of examining the flowers and leaves of "the Guadaloupe cinnamon-tree.—It agrees with that "deſcribed by Jacquin at Martinico, and alſo with "that found by Mr. Banks and myſelf in the Brazils. "It likewiſe agrees botanically with the Eaſt Indian cin-"namon-tree, particularly in its fructification.—The "leaves vary or differ a great deal every where, perhaps "from ſoil and climate.

"From obſervations made by ſkilful perſons, it now "ſeems clear, that even the caſſia-tree is only a variety "of the cinnamon-tree; and that culture has made the "Ceylon

yet, if a few plants of the latter could be got, it would put that matter beyond a doubt. The ſame thing may be ſaid with reſpect to the Tobago nutmeg. For, though they undoubtedly are a ſpecies of nutmegs, yet it is not eaſy to ſay whether grafting, pruning, and other culture, will ever bring them to be equal to the Eaſt India nutmegs.

The other things wanted from the Eaſt-Indies are drugs of all kinds, both medicinal, and for dying: viz. ſeeds or plants of gum ammoniac; aſſafetida; benjamin; gamboge; cardamums; coculus Indicus; dragon's blood; gum Arabic; myrrh; olibanum; opoponax; (theſe two laſt are likewiſe produced in Perſia.) To theſe may be

" Ceylon cinnamon ſo much preferable to that which " grows in other countries. I, therefore, hope, that, with " your attention to the culture of ſo valuable a tree, it " may in in time become in the Weſt Indies as fragrant " and aromatic as it is in the Eaſt Indies."

Doctor Solander's aſſertion, with reſpect to the ſameneſs of the caſſia-tree with the cinnamon-tree, is greatly confirmed by the obſervations and experiments formerly made by Mr. Coombs. He reſided above ſixteen years in Bencoolen, and the company's ſettlements dependent on it: during which time, he took great pains in the cultivation and improvement of the caſſia-tree; and was convinced, that, if his bad ſtate of health had not obliged him to come to England, he ſhould have produced cinnamon from that tree equal to the beſt of Ceylon. Many of the quills, in the ſpecimen of the caſſia he brought home with him, were indiſtinguiſhable, even by able judges, from good cinnamon.

added,

added, opobalſamum, or balſam of Gilead, from Arabia; ſagapenum, red and white; maſtic; gum tragacanth, from Turkey; as likewiſe Japan earth, and zedoary root; as alſo walking-canes of all kinds, and rattans. There is a cane of a larger and coarſer kind in the Eaſt Indies, that ſerves for hoops, and would be a great acquiſition to the planters in the Weſt Indies.—From Africa ſeveral things are wanting: viz. gum ſeneka, and other gums; grains of paradiſe; camphire, and other dyeing woods:—from the Spaniſh main, ſome very capital articles, viz. the Peruvian bark; jalap, ipecacuana; balſam of Peru; balſam of Tolu; cochineel inſects, &c.

Now, as the Society have it much in their power, by means of their correſpondence in the different parts of the world, to procure ſeeds, if not of all, at leaſt of the greateſt part of theſe articles, I moſt earneſtly beg their aſſiſtance in that reſpect.

As to the expences of the botanic garden, they have fallen wholly upon general Melville, whilſt in his government. But, after that period, I have been at the chief expence, as well as at conſiderable charges in collecting plants, and ſeeds, from ſeveral iſlands: and, although the ſeveral plants, for which the Society offered premiums, were not raiſed within the time limited by their advertiſements, yet, I hope, they will think

think my labour, and attention to this ſubject, worthy their regard *.

After having given this ſhort narrative of the riſe, progreſs, and preſent ſtate of the garden, as well as what may be expected from it in future, I hope, the Society will think, it may be of public utility, if properly attended to, and ſupported. If this is not obtained, I am afraid, it will fall to the ground, after all that has been done. For it is a great chance, whether the ſurgeon, who may ſucceed, will have any taſte for botany; or whether he will forego his practice among planters and their negroes, to take care of it.

Mr. Adair has ſent out a chemical apparatus for analyſing vegetables: and general Melville has made a donation of many valuable books, and ſeveral other things: viz. a refracting teleſcope, ſixteen feet long; a thermometer, a barometer, a microſcope, a concave mirror, an hydroſtatic balance, and an air-pump, &c. Sir William Young has made a preſent of an electric machine; of Brown's Natural Hiſtory of Jamaica; and of a ſet of artificial load-ſtones. As

* Doctor Young received the gold medal of the Society, as a mark of their approbation of his undertaking: as did alſo general Melville, for the patronage and aſſiſtance he gave to it.

ſo

ſo much has been done, it would be a pity if a little more could not be contributed. But all this is ſubmitted.

I am, Sir,

Your very humble ſervant,

GEORGE YOUNG.

Certificate of Indigo produced on Mr. *Strachey*'s Plantation, in Saint Vincent's, with the Culture and Proceſs.

℔ 5½ THESE are to certify the Society of Arts, Manufactures, and Commerce, that the ſample of indigo *, which will be herewith produced, marked as on the margin, was made on the plantation of Henry Strachey, eſq. under my management, on the river Saint John's, in the province of Eaſt Florida, in the ſummer 1772, from a light ſandy ſoil, well

* This certificate was ſent in claim of the premium of a gold medal, "offered for the beſt ſpecimen of indigo "made in his majeſty's dominions in America, or the "Weſt Indies, equal to Guatimala indigo, not leſs than "four pounds, to be produced to the Society, with cer-"tificates of the place where it was made, and an ac-"count of the culture and proceſs, on or before the firſt "Tueſday in February, 1775." The ſpecimen was found fully equal in the quality to the ſtandard required; and the gold medal was accordingly adjudged to Mr. Strachey.

prepared,

prepared, planted in rows about twenty inches aſunder, and kept very clean.—The time of planting in this province is generally in the month of March.—

Proceſs.

I cut the weeds as ſoon as they begin to flower, or as ſoon after as poſſible; early in the morning is the propereſt time for cutting, ſo as to have the ſteeper filled with the weeds, and the water pumped on it, before nine o'clock. In the height of ſummer (when we make the beſt indigo) I ſteep from ſix to eight hours; and know when the weed is ſufficiently ſteeped, by the fermentation of the liquor; or from its colour, by drawing off a little in a glaſs, when it is of a gold or orange colour, and the weed at this time quite inſipid.

When by theſe obſervations, I judge the weeds ſufficiently ſteeped, I let off the liquor from the ſteeper into the beater: and before I begin to beat, I add lime-water, ſufficiently to raiſe a good grain; the liquor then appears of a deep green. I commonly beat about an hour, during which, the liquor turns to a deep blue colour; and the grain, which at firſt putting in the lime-water, looks like ſmall flakes of ſnow, floating

floating in the liquor, is now reduced to ſmall, and almoſt imperceptible round grains.

The beating being finiſhed, I let the liquor ſtand all night in the beater: and, in the morning, the indigo being ſubſided, I let the water off, by plug-holes at different heights, ſo that the ſediment only remains. This is now nearly the conſiſtence of cream, which I then put into a drainer, where I let it remain, until the water is drained from it: when it appears like ſoft curds. I then preſs it in an oblong ſquare preſs: where it undergoes much the ſame operation as preſſing cheeſe; and when taken out of the preſs, is nearly of the ſame conſiſtence as green cheeſe. I then cut it into pieces about two inches and a half ſquare; and afterwards dry it, until it is in colour, and conſiſtence what you now to ſee it.

ALEX. GRAY, Agent for
Henry Strachey, Eſq.

Sir

Sir *Alexander Dick*'s Letter, on his Culture and Preparation of Rhubarb.

Preſtonfield, October 1ſt, 1774.

SIR,

AS I obſerve, by your printed liſt of this year, that there are premiums given for the culture of the true rhubarb: all which I take for granted are, according to the terms of your general advertiſement, confined to the cultivators in England, Wales, and Berwick upon Tweed. But in the article reſpecting the production of a ſpecimen of the roots of this true rhubarb, in order for examination, I obſerve a ſpeciality, which ſeems to extend the premium to all Britiſh cultivators. Partly on this account, but chiefly from the deſire of contributing my endeavours to forward the laudable views of your Society, I have taken upon me to trouble you with this letter: which is become the more neceſſary, as, for theſe twelve years paſt, there has not been any ſociety in Scotland for the encouragement of arts and agriculture, to which any uſeful diſcovery of this kind could be addreſſed.—I may ſay further, that you publicly deſire in your printed pamphlet, any information or advice, that may forward the deſigns of your Society; which you

you ſay will be thankfully received, and duly conſidered, if communicated by a letter addreſſed to the Society, directed to you as their ſecretary, at their office, London.

I begin, by informing you, that, with regard to the introduction of this valuable plant into Britain, the inhabitants of the north ſide of the Tweed flatter themſelves with having had ſome merit; the grounds of which I ſhall here lay before your Society.

For ſeveral years, previous to the year 1762, whilſt Mr. Keith, my brother-in-law, was Britiſh miniſter at the court of Peterſburgh; and during ſeven of theſe years, that I had the honour of being preſident of the Royal College of Phyſicians at Edinburgh; I propoſed to the college, (to which they agreed) that, in their name, I ſhould open a correſpondence, by Mr. Keith's means, with our learned countryman Dr. Mounſey, then chief phyſician to the late emperor of Ruſſia, and preſident of what is called there the Chancery of Medicine, concerning foreign plants, and ſeeds; particularly thoſe of the true rhubarb: which had been long among the *deſiderata*; and was likely to have continued to be ſo for ages: as the true rhubarb, by Dr. Mounſey's beſt information, grew with-

in the Chineſe wall; which was vigilantly guarded in every corner.

But, by the power of the Chancery of Medicine, in placing phyſicians and ſurgeons with inſtructions, in every part of the empire, but more eſpecially in the eaſtern parts; and on account of the great credit Dr. Mounſey had with the emperor; ſuch ſteps were taken, that this Chineſe vigilance was at laſt eluded, and a box of ſeeds of the true rhubarb was conveyed ſafe to Peterſburgh, by the meaſures, which his late predeceſſor Dr. Kau Boerhaave had begun, but did not live to ſee effected; and which were reſerved for Dr. Mounſey, who ſucceſsfully accompliſhed them, and cauſed ſome of theſe ſeeds to be ſown in the imperial gardens.

Of this, I had the moſt early information: which, I immediately communicated to our Royal College: and they ſoon after made Dr. Mounſey an honorary member of the ſame. For which, by his letter to me, he ſignified the greateſt ſatisfaction, having been educated as a phyſician, thirty years before in our univerſity here: and his purpoſe being, ſoon after, to leave Ruſſia with his family, and the large fortune he had made; and to purchaſe a land-eſtate in Scotland, and retire from the buſineſs of his profeſſion. This he accordingly

ingly did: and during ſeveral years before his death, he enjoyed *otium cum dignitate*; and was the means of procuring us ſeveral other curious ſeeds from thoſe eaſtern parts.—As I greatly reſpect his memory, and am fond of doing juſtice to it, eſpecially on this occaſion, ſo I muſt beg leave, to inform the Society, that it is to him alone, and from the above circumſtances, that Britain is indebted for this valuable plant.

Upon his arrival at Edinburgh, in the year 1762, I was the firſt perſon, he inquired after: when he preſented me with a good parcel of the ſeeds: which I immediately ſowed in my garden at Preſtonfield, and have marked the place for a monumental inſcription in honour of my friend's memory; and mentioning the place, and year, where the firſt of theſe valuable plants grew.

I called a meeting of the Royal College ſoon after; and preſented Dr. Mounſey to them: who received him with the greateſt reſpect, and gratitude. He brought a parcel of the true rhubarb ſeeds to the meeting: which were conſigned to Dr. Hope, profeſſor of botany in our univerſity: who was then laying out the royal phyſic-garden; which is now come to great perfection; and where he raiſed this plant for the uſe of the ſtudents.

In a few years afterwards, Dr. Hope purchaſed a piece of ground of a proper ſoil; and planted out ſome hundred plants, to ſerve the public, after the proper number of years were elapſed; and the roots fully matured: which, by Dr. Mounſey's advice, ſhould not be leſs than eight years.

The College deſired Dr. Hope to tranſmit ſome of the ſeeds to his majeſty's gardens at Kew: and to ſome noblemen and gentlemen, who were well-wiſhers to, and honorary members of the college: ſuch as the earls of Bute, and Hopetown, and the duke of Athol, the laſt of whom has now a very large plantation at each of his caſtles of Blair and Dunkeld.

Dr. Mounſey, likewiſe, ſent ſome of the ſeeds, ſome years afterwards, to ſeveral other gentlemen of his acquaintance in England; whoſe names I have forgotten: and he alſo ſowed ſome ſeeds in his own garden at Ramerſcales, in Annandale, an eſtate he had purchaſed after his arrival in Scotland.

From this ſcource, as I have informed you, originated the great number of plants that are now ſpread in the courſe of theſe twelve years, through Britain: and Dr. Mounſey has in many places, and in ſome ſocieties, had his merit acknowleged on this account.

It

It only remains, that I inform you of ſome of my own obſervations, which I have made during theſe laſt twelve years, upon my great plantations of rhubarb, in my garden here: which, young and old, are conſiderably above a thouſand plants: and theſe, I communicate to the Society with pleaſure; and ſhall be glad, if it can be of any uſe to anſwer its laudable purpoſes.

They are as follows.

1ſt. I find you annex to article 137, that the plants, you require from the competitors for premiums, ſhould ſtand at leaſt ſix feet aſunder. This, indeed, we did obſerve in our firſt plantations of rhubarb: but being better acquainted with the nature, and growth of this plant, and from full experience for ſeveral years, I find (and my learned friend Dr. Hope, profeſſor of botany, here agrees with me) that in good ground of a black mould, inclining to ſand of a pretty deep ſtaple, well trenched, dreſſed, and free of ſtones, of a ſouthern expoſition, if poſſible, there is no neceſſity for ſetting the plants, which are to remain for eight years, at a greater diſtance than three feet from one another: in conſideration, that garden-grounds ſo employed in keeping ſuch plants for eight years at the diſtance of ſix feet from one another, would greatly enhance the price of this root to

the public; and diminiſh the profit of it cultivators, and not materially increaſe it quantity, or improve its quality. For I have taken up here roots of eight years old of an excellent quality, that had ſtood at the diſtance of three feet from one another, and which weighed when cleaned upwards of twenty pounds. In comparing theſe roots with thoſe that had been planted ſingly, or at the diſtance of ſix feet from one another, we could not obſerve any difference between them, either in regard to their quantity or quality, in caſe the ſoil, where each grew, was equally good.

2d. I would recommend the ſowing of the beſt ſeeds, either in ſeed-beds, or in the place where they are to remain, at two different ſeaſons, either in the end of March, or in the end of July or Auguſt.—The firſt for thoſe, who are beginning plantations, to give them ſo many months advance: and as the ſeeds are then very dry, it is neceſſary to moiſten them in water, two or three days before ſowing: which cauſes them to come up more quick, and numerous; and, likewiſe, prevents a fly of a particular kind from deſtroying them, when their vegetation is ſlow.

In the end of July, or beginning of Auguſt, the ſeeds of the moſt vigorous plants come to perfection: for which cauſe, I have tried the ſowing of the ſeeds at that ſeaſon:

ſeaſon: and they ſoon ſhowed very fine vigorous young plants; which ſtruck a good root before winter.

It is amazing to ſee, how well the true rhubarb-plants ſtand our ſevereſt winters here, near Edinburgh: for during theſe laſt twelve years, though my plants were not covered with ſtraw, or litter; and there being two very ſevere winters, in which the froſt had got above a foot in the ground, and Farenheit's thermometer was ten or twelve, and once eighteen degrees under the freezing point; yet I do not remember loſing a ſingle plant during theſe ſeaſons.

In the months of May, and June, if the weather is kindly, the quickneſs of the vegetation of the rhubarb-plant is ſo great, that, in the ſpace of twenty-four hours, it has been obſerved to grow to the extent of ſix inches; and commonly to keep pace with the thermometer, and denote daily the quantity of the ſpirit of vegetation, that is in the ground, ariſing from the increaſe or decreaſe of heat, and moiſture, with more preciſion than any other plant, we know.

The flowers, when they appear, are very beautiful; and may be uſed as an ornament to the beſt gardens: and, as the plant is of a perennial nature, it falls down annually in the autumn; and, riſing annually

in the ſucceeding ſpring, is amongſt the moſt early vegetable productions from the parent roots, that we have.

Some of the plants with me have riſen to twelve feet high, in the ſpace of three months.

3d. Another material obſervation, I have made, is, that the great roots of the plant are much hurt, if the ſtem is allowed to riſe up to perfect its flower and ſeeds. I, therefore, take care, in the month of May, to cut away the ſtem pretty low; but not ſo as to hurt the leaves: and I have obſerved afterwards, that the leaves become extremely large, and broad: which I preſume, as the leaves decay, tends to improve the root.—I have, likewiſe, to ſave ground, made plantations of this rhubarb in ſhruberies: where I find they grow even under trees: and, for ornament, I allow the flowers here and there to come to perfection.

4th. Dr. Hope, our worthy profeſſor here, communicated to me ſome time ago, a curious obſervation: which he made in the royal phyſic-garden under his care, viz. That, as he was obliged to have, in his garden, a plant of the rheum palmatum: ſo he had, likewiſe, in its contiguity a plant of the monk's rhubarb: a very coarſe ſpecies of that genus, of little value.—Both plants happened, at the ſame time that

that ſeaſon, to be vigorouſly in the flower: and the rheum palmatum, having perfected its ſeeds, he ſowed them: but, to his great ſurprife, the leaves of the plants, which followed, were not palmated, but roundiſh: which raiſed a ſuſpicion, that the intermixture of the farinas of the two plants was the cauſe of this: which might hurt the nature of the roots of this ſtranger, which we had got into our gardens.—The doctor ſaid, that ſomething of the like kind, he was informed, had happened in a plantation belonging to the duke of Athol. This matter, however, is new, and only under deliberation: but what happens to the ſeeds, that are ſown of theſe two plants *hinc inde* will be more particularly examined.

In the mean time, I would recommend, that no plant of the monk rhubarb, which is commonly kept in kitchen-gardens for early ſpring-tarts, ſhould be allowed to come to the flower; but what is more early, better, and has a finer acid for tarts, is the thick ſtalk of the leaf of the true rhubarb: which will anſwer every purpoſe of the tart kind, to full ſatisfaction, as I have experienced for ſome years paſt: and it is an eaſy matter to dedicate ſome plants of the true rhubarb in every kitchen-garden, for that purpoſe.

5th.

5th: I come next to my obſervations on the preparation, and curing of the roots of the true rhubarb, after they have attained their full age in the ground. And I am more enabled to preſent them before you Society: as I have now by me ſeveral pounds of the roots of the true rhubarb, every whit as good at that, which is imported from China: or what is called the Turkey rhubarb; which the caravans bring to Smyrna: its medicinal effects having been fully tried on a variety of occaſions, to the ſatisfaction of my brethren of the Royal College of Phyſicians in Edinburgh: who have all had ſpecimens of it from me; and who have now, on their laſt edition of their Pharmacopœia, introduced it to be kept in the ſhops for their preſcriptions, under the title rheum foliis palmatis accuminatis, L. Sp. Pl. 531.

It has been obſerved, by ſeveral, that it tinges the urine with a deeper and brighter yellow colour, and ſooner than the foreign rhubarb; and, conſequently, may remove obſtructions of the kidneys better: nor is it attended with that diſagreeable coſtiveneſs, that hath been experienced from the foreign rhubarb: which is probably owing to that being too much toaſted in the drying, to make it anſwer the readier for commerce during long voyages, and journies.—To prevent mine, when cured, from

from contracting moiſture, I have it wrapped up in boxes, with cotton interſperſed betwixt the pieces of the rhubarb.

6th. About four years ago, when my plants were eight years old, I began to take up ſome quantity of the roots of the rhubarb, in my gardens: and, to try, if I could hit upon the right method of curing the roots.—At my firſt ſetting out, I was very unſucceſsful: Dr. Mounſey having had no intelligence from China of the Chineſe method, to communicate to me. Some, indeed, he ſaid, thought, it was done in ſtoves heated.

My miſtake lay in imagining, it was proper to dry the roots very gradually by cutting them in ſlices, not very thick; and hanging them by ſtrings on the ſide of a wall in a room well ventilated with air, and well expoſed to the ſun in the ſpring-months, before the ſap began to riſe in the root: but a very few days ſhewed me my error.

An univerſal mouldineſs, appeared on the roots, I had hung up: which prevaded their ſubſtance; and which, even by putting the roots near a fire, I found could not be removed. Owing to this unlucky circumſtance, all the roots, I had cut, and treated in that manner, were good for nothing. I therefore reſolved to alter my method;

method; and, likewiſe, to take them up at a different ſeaſon.

Accordingly, in the ſubſequent month of October, I took up a large root, weighing nearly about twenty-four pounds. My gardener, having dug very carefully to the bottom of its tap-root, and ſide-branches: and, after it was well waſhed, and cleaned, I cauſed him to ſeparate all the fibrous parts from the large knobs, and thick middle-part of the root: which reduced it to about fifteen pounds. This I cut into ten or twelve thick pieces; and made him peel off the outer ſkin of each of them, and then propoſed to proceed to dry it as the other root, by the force of a much warmer degree of heat, in a place where, as it happened, there was, likewiſe, a great circulation of air.

The pieces were, therefore, ſtrung, and hung upon the lintel of my large kitchen-chimney; as there was a continual fire kept there: the kitchen being thirty-ſix feet long, eighteen wide, and ſixteen feet high: not a vault, but very well aired. This I found had the deſired ſucceſs: for by a good degree of heat, and a good deal of air, the moiſture, which was in the roots, ariſing from a clear tranſparent gummatious mucilage, was duly overcome, before it could contract the leaſt mouldineſs: inſomuch, that, in the ſpace of three weeks,

weeks, from fifteen pounds, at hanging up, it decreaſed till below five pounds. This clean mucilage, and ſome fine reſinous parts, are eaſily diſcernible by a microſcope, when the roots are cut tranſverſly after being taken up. This firmneſs being once obtained, I cauſed my gardener to get a large ſtrong grater, or raſp; and to grate down the outer coat, the ſides, and corners of theſe large pieces pretty far in: which conſiderably diminiſhed their ſize; and reduced the five pounds, formerly mentioned, to about three pounds.

I laid aſide the raſpings for medicinal uſes; which anſwer very well: and, having ordered ſome large holes to be bored through the remaining large pieces, and placed them, for two or three weeks, above the lintel of the chimney-piece in my library, where a more moderate fire was kept; and, after giving them a ſecond raſping, and rubbing them with ſhagreen, the heat having prevaded the whole ſubſtance of the roots; at the end of three weeks, they came to the perfection I have brought them. And, in order to prevent a ſecond attack from moiſture, which they might contract from the air, I put that parcel, and ſome other parcels I managed in the ſame manner, into a box, where cotton was interſperſed betwixt the roots ſo prepared: which has now ſatisfied my utmoſt

moſt wiſh, and that of the gentlemen of our faculty here: and I am convinced, that the parcels, ſo packed up, may be ſent any where for medicinal uſes, as well as commerce.

I have ſeveral pounds of the raſpings, which are extremely dry, and fine; kept in glaſs bottles, and uſed for the powder of rhubarb in my own family, and by my friends, when they have occaſion for it.

Upon the whole, if in Britain, or any part of its dominions, the introduction and true preparation of this valuable plant, can promote the public good, and health of the people; and ſave the ſending out of the kingdom, to foreign parts, great ſums of money for this article of commerce; I ſhall gain all the ends I could poſſibly have in view, in ſetting forth this matter to your Society: whoſe laudable purpoſes, I ſhall always endeavour to promote.

I have the honour to offer my very beſt reſpects to all its members, and am with due regard,

Sir,

Your moſt obedient,

humble ſervant,

ALEXANDER DICK.

Vita brevis ars longa.

Theſe

Theſe knots of the true rhubarb, which grew at Preſtonfield, are ſent to the Society of Arts by Sir Alexander Dick of Preſtonfield, near Edinburgh, North Britain.

They contain four pounds and a half, at ſixteen ounces of rhubarb to each pound, or ſeventy-two ounces *.

Preſtonfield, 15 December, 1774.

SIR,

BY your letter of the 3d of November, you mention your having received my paper on the culture of the true rhubarb, which you ſaid was read to the Society, and referred to a committee. I ſhall be very happy to know, if it has had the good fortune, alſo, to have the approbation of ſo reſpectable and learned a Society: or if any remarks have been made, which I may have due regard to in my after-reſearches. For though I am ſeventy-one years of age, I conſider myſelf as always learning, eſpecially in matters of natural knowledge. At any rate, in my country retirement here, it will be my greateſt ſatisfaction, to think,

* The gold medal offered for the beſt ſpecimen of the true rhubarb, being not leſs than four pounds weight, and of Britiſh growth; and equal in quality to what is commonly ſold under the name of Turkey rhubarb, was adjudged to Sir Alexander Dick, for this quantity.

I can

I can any way promote the noble, and public ſpirited views of the Society of Arts, Manufactures, and Commerce, to the members of whom, and to yourſelf, I have the honour to ſubſcribe myſelf with the moſt perfect reſpect and regard,

Your moſt obedient,

and humble ſervant,

ALEXANDER DICK.

To Mr. Samuel More, &c.

Preſtonfield, 11th February, 1775.

SIR,

I hereby acknowlege I have received from Dr. William Fordyce, phyſician in London, the elegant gold medal your Society of Arts, Manufactures, and Commerce, have been pleaſed to adjudge to me, and honour me with, for having produced to them the beſt ſpecimen of Britiſh rhubarb: which, indeed, grew in my garden of Preſtonfield here: as likewiſe he ſent me two trimmed pieces of mine, which in your letter to me of December the 8th, 1774, that gave me the above notification, you there deſire ſhould be obſerved to imitate in after-preparations of rhubarb roots; and which I ſhall carefully notice, having taken up lately a good deal for the public ſervice; and

and am much obliged to the Society for the information; to whom, and to yourſelf, I am, with the greateſt reſpect and eſteem,

Your moſt obedient,
and very humble ſervant,
ALEXANDER DICK.

To Mr. Samuel More, Secretary to the Society for the Encouragement of Arts, Manufactures, and Commerce, London.

Mr. *Callender*'s Certificate and Letter, concerning the production of a Specimen of Rhubarb in the Britiſh Dominions, and its Culture and Preparation.

WE, whoſe names are hereunto ſubſcribed, do certify, that the pound of rheum palmatum, or true Turkey rhubarb, now ſent to Meſſrs. John and John Field, ſeedſmen in Thames-ſtreet, London, to be preſented to the Society of Arts, Manufactures, and Commerce, is a part of four pounds, excluſive of the extremities, or ſmaller roots, which this ſeaſon was raiſed in the nurſery of Meſſrs. Michael and John Callender, in the town and county of Newcaſtle-upon-Tyne.

Newcaſtle, 31ſt Dec. 1773.

RICHARD LAMBERT, ſurgeon to the Infirmary, Newcaſtle.
JOHN LEIGHTON, ſurgeon, Newcaſtle.
JOHN DOUGHTY, druggiſt, Newcaſtle.

To the Society for the Encouragement of
Arts, Manufactures, and Commerce.

Newcaſtle, February 5 1

GENTLEMEN,

FROM the encouragement given by you to the different arts and ſciences; and for the good of our country, we are induced to ſend, for your inſpection, the incloſed pound of rheum palmatum, or true Turkey rhubarb.—We have been trying experiments for the cultivation of that valuable plant, for theſe ſeven years, in different expoſures, and different ſoils. But the drying, or curing the ſame properly for uſe, we only laſt ſeaſon diſcovered, and could not have it ready, in order to preſent to the Society by the time limited in the premium book *.—As, therefore, the premium cannot be granted, we hope we may at leaſt be indulged with a bounty from the Society of gentlemen, for our making our experience public. The gentlemen, who ſigned the certificate, did carefully attend

* This alludes to the premiums offered by the Society, as mentioned in note *, page 223. Mr. Callender afterwards ſent the quantity required by the advertiſement, and was admitted a candidate: the quality was allowed to be what was required, but not being equal to that of the ſpecimen produced by Sir Alexander Dick, the gold medal was adjudged to him; the ſilver medal, being the ſecond premium, was adjudged to Meſſrs. Callendar.

the

taking the plant out of the ground; one of them packed upthe ſame, as it is now ſent to your hand: and that you may be certified of our perſonal characters, the bearer, Mr. Field, will ſatisfy you on that head.

We are, Gentlemen,

Your moſt humble ſervants,

MICHAEL and JOHN CALLENDER.

P. S. We raiſed in the year 1772, about eighty plants; but moſt of thoſe were ſold to different parts of this kingdom; and ſome to America.

Newcaſtle, October 26, 1774.

GENTLEMEN,

WE now ſend you the remainder of the four pounds of the rheum palmatum, or true Turkey rhubarb, for your farther inſpection; and have, alſo, put into the box a few of the extremities, or ſmaller roots, that you may ſee, they are as fit for preſervation as the larger.—We have uſed various ſituations for the cultivation of this valuable plant; but find it grows beſt in a northern expoſure: being as hardy as a common dock. In other ſituations, eſpecially when expoſed much to the ſun, we find, though it flowers ſtrong, yet very

rarely any ſeeds come to perfection; though in the other they are maturated. Plants from ſeeds come to a larger ſize than from off-ſets. And it is not proper to be taken out for curing till five or ſix years old. The latter end of Auguſt is a good ſeaſon.

It requires a dry air, to cure the rhubarb: being a plant ſo full of ſap. Sixteen pounds of neat green rhubarb, dried to leſs than five.—We would have made the holes larger: but this, we found was productive of much waſte: which, in order to make your quantity, we could not then ſpare; as we ſell the plants when young to gentlemen, who are curious for their cultivation.—

We dry the roots, where there is a conſtant fire, in a large room: in which, at the ſame time, is a circulation of free air. Any damp air makes it grow mouldy.—Before we hung it up to dry, we decorticated it.

We are, Gentlemen,

Your moſt humble ſervants,

MICHAEL and J. CALLENDER.

ARTICLE

ARTICLE X.

Principles of an improved Plough, by Mr. CLARK:—*Method of diſcovering the excellence of Wheel-Carriages, by Mr.* CLARK:—*Account of the Conſtruction, and Advantages of a Plough with a circular Coulter, by Mr.* PETERS:—*Deſcription and Manner of Conſtruction of a flat Arch for the Cielings of Rooms, in Houſes, or other Buildings, to prevent the communication of Fire, by Mr.* ARROW:—*Account of a cheap and effectual Method of making, or repairing Banks, to prevent the overflowing of Land by the Sea, or great Rivers, by Captain* PAGE: *communicated to the* Society for the Encouragement of Arts, Manufactures, and Commerce; *and inſerted at their Requeſt.*

To *Robert Deſſie*, Eſq.

SIR,

THE Society for the Encouragement of Arts, Manufactures, and Commerce, have directed me to deliver to you Mr. *Clark*'s principles of an improved plough; and method of diſcovering the excellence of wheel-carriages;—Mr. *Peter*'s de-

deſcription of a plough with a circular coulter;—Mr. *Arrow*'s conſtruction of an arch for rooms, to prevent the bad effects of fires;—and captain *Page*'s explanation of an effectual method of embanking; in order to their being inſerted in the Memoirs of Agriculture, if you think proper.

I am, Sir,

Your very humble ſervant,

SAMUEL MORE, ſec.

To Mr. *Samuel More*, Secretary to the Honourable Society for the Encouragement of Arts, Manufactures, and Commerce: London.

DEAR SIR,

HAVING been favoured with one of the Society's Premium Books, publiſhed in the year 1770, I obſerved, amongſt many other uſeful propoſals, one for the moſt ſatisfactory account of the principles of conſtructing a plough, ſo as moſt effectually to diminiſh friction, preſerving at the ſame time all the requiſite properties.

This ſubject, though of very great importance, has not been particularly handled by any author that I have read or heard of: the people who make ploughs, as far as I have had an opportunity to make inquiry, and that

that I have had in moſt counties in England, are quite deſtitute of any rational theory to work by.

And as for the ploughmen themſelves, they have honeſty enough to diſclaime any pretenſion to theory. What they ſtudy is, to make good work with ſuch as are put into their hands: and, by their dexterity rather than that of the inſtruments, we have the fields in general well plowed, but not with the greateſt eaſe to the moving power. Any attempt towards an improvement of that noble inſtrument, I preſume, therefore, will be acceptable to the Society: and I hope you will have the thoughts of many candidates for this premium. All the improvement I have been able to point out is mentioned in the following ſheets, with a figure or two, to render it the more intelligible; the figures are only what I ſketched out with my lead pencil for my own uſe, and therefore too mean to be laid before the Society. But being prevented making them out in a better manner, to be given in within the time mentioned in the Premium Book, I have been obliged to ſend them, or none, which I deſire you will be pleaſed (together with the deſcription, &c.) to lay before the Society, in whoſe determination I ſhall chearfully acquieſce; and am content, for the ſake of the improve-

ment of this noble inſtrument, to wiſh my endeavours may be exceeded.

I am, dear Sir, reſpectfully,

Your humble ſervant,

February 4th, 1771.

P. S. As it is required in the Premium Book to ſend an addreſs ſealed up, I alſo ſend it herewith, marked with the above mark.

Account of the Principles of an improved Plough *.

AS the line of traction is of the greateſt importance to be well conſidered, in order to form a true idea of the principle of conſtructing a plough upon a rational theory, I ſhall, in the firſt place, attempt to explain its properties.

Firſt, as it affects the horſes, which draw the plough: and, *ſecondly*, in what manner it affects the plough.

* This piece was ſent by Mr. Cuthbert Clark to the Society, in claim of the premium offered by them "for "the moſt ſatisfactory account of the principles of con- "ſtructing a plough, ſo as moſt effectually to diminiſh "friction: preſerving at the ſame time all the other re- "quiſite properties."—The gold medal was, accordingly, adjudged to Mr. Clark for this performance, in 1771.

As

As the ſhoulder of thoſe kind of horſes, which are allowed to be the moſt proper for ploughs, &c. generally lie at an angle of about ten degrees, thirty minutes; computed from a perpendicular as *a*, *b*, *c*, in Fig. 1ſt, in order to have the collar impinge upon the greateſt ſurface of the ſhoulders; which is abſolutely neceſſary to preſerve the ſkin upon the horſe's ſhoulder, &c. and to give the creatures the beſt chance for reſpiration, and uſing to the greateſt advantage their muſcular force; the line of traction ought to lie at right-angles to that, which their ſhoulders make with a perpendicular, as above ſaid.—A demonſtration of the above aſſertions, which I believe to deſerve the authority of axioms, would require a more copious deſcription of the mechaniſm of a horſe, &c. than the nature of this eſſay will admit of: and, therefore, I muſt leave any further corroboration to be determined by obſervation, &c. The angle of the line of traction, to interſect the angle of the ſhoulders, ought, therefore, to make an angle with the horrizon of ten degrees, thirty minutes, as *f*, Fig. 1ſt. Having fixed the line of traction; and ſhewn what appears to me to be the good effects of this poſition, in regard to the horſe, &c.; I ſhall conſider, in the next place, its effects upon the plough.

The place of contact of the line of traction, and plough, ought, if it were practicable, to be at the point of the ſhare: as at, or near that point, the center of percuſſion lies: but, as it is impoſſible the line of traction can be connected at that point without interrupting the operation of the inſtrument, another point muſt be ſubſtituted; and, in courſe, ought to be as near to the point of the ſhare, as the convenience of the inſtrument will admit of. For, the greater the diſtance is, the longer the lever will be: and conſequently the more powers the ſhare, &c. will gain; and thoſe powers have a tendency to ſink the ſhare into the ground, rather than to communicate to it a horizontal motion. To fix this diſtance, as I ſaid before, there is no datum, but that it muſt be the leaſt, the convenience of the inſtrument will admit of: and that, I humbly preſume, cannot be leſs than fourteen inches, in a plough, which is to perform only common work, taken perpendicularly above the point of its ſhare; as the line *d*, *e*.

From the above conſiderations, it muſt be abſurd to connect the line of traction at an angle behind the point of the ſhare: as it unavoidably either loads the wheels unneceſſarily, by giving the ſhare too great a tendency to ſink into the ground; or, if there be no wheels, cauſes the tail of the plough to riſe, ſo as to make it hop, as it were,

were, upon the point of the ſhare: either of which gives the balance cruelly againſt the horſes; fatigues the holder; and ſpoils the land. The line of traction being fourteen inches above the point of the ſhare, at the point of contact with the plough, it will, upon the ſhoulder of a horſe of full fifteen hands high, be about four feet one inch, above the ſurface of the track the horſe treads upon. I would not be underſtood to mean, that this is the preciſe point which every horſe of that height ſhould pull at; for there is a great difference in the depth of the cheſts of horſes; and regard ought to be paid to it. But, in general, the above height will anſwer very well. The line of traction will, therefore, be ſimilar to the line *f*, *g*, in Fig. 1ſt; and the diſtance between theſe two points is fourteen feet ſix inches: of which, ſix feet muſt be allowed for length of beam, and cap (the neceſſity of which will be ſhewn hereafter). There remains eight feet for the horſe's body, whipples, &c. a ſpace, I humbly preſume, very convenient for a horſe of the above ſize: and in caſe of a larger, which requires more length, or a ſmaller which can do with leſs, the poſition of the line of traction continues the ſame: becauſe this angle is proportioned to the mean height.

The poſition, and length of the line of traction, being aſcertained, I ſhall next

point

point out, how the powers, the elevation of the place of connection of the line of traction gives to the ſhare, which have a tendency, to make the ſhare ſink too much into the land, muſt be counteracted, both in the ſwing-ploughs, and wheel-ploughs.

And, *firſt*, of the SWING-PLOUGH.—The method to counteract the above mentioned bias in this plough, depends upon the length, and poſition, of the beam; and the place of connection of the line of traction. For, by the beam's being kept low at the point, where the line of traction connects, the horſes, &c. have a purchaſe to countervail the bias: and as this commonly is, or ought always to be, limited by the conveniency of the inſtrument, I ſhall ſuppoſe, it may be fourteen inches above the ſurface of the land, at the end of the beam; and the ſame height above the point of the ſhare. And I ſhall, alſo, ſuppoſe, that the line of traction is elevated at the horſe's ſhoulders four feet and one inch, as in the above computation. Then we have a ballance of twenty-nine in favour of the countervailing power. Taking the plough to be ſix inches within ground, or making a furrow ſix inches thick, the fourteen inches above the ſurface, and thoſe ſix, make twenty: which being ſubtracted from forty-nine, there remains twenty-nine as above. A further demonſtration of this will

will be given in the explanation of the countervailing power of the wheel-plough. This will be ſufficient to overcome all the reſiſtance, the ſhare, and coulter meet with, &c. at the times when the ſoil is yielding: which are the only ſeaſons when the ſwing-plough can be uſed to any purpoſe. For, when the ſoil is ſtubborn, or a great depth to be plowed, a more effectual contrivance to countervail the bias, which the ſhare, &c. have acquired by the reſiſtance of cutting, and raiſing the furrow, and by the elevation of the place of connection of the line of traction, muſt be applied. And, of all the ſimple mechanical powers, I cannot ſee any better ſuited to anſwer the purpoſe than the beam O: being a lever of the ſecond kind, with its fulcrum *r*, *q*, It is true, a prop or fulcrum being let fall from the point *m*, upon the line of traction at N, were the line of traction inflexible, and no obſtacle at the point of the ſhare, the plough would keep its bottom *d*, S, in a horizontal direction. Becauſe the angle *m*, N, E, and *d*, *n*, *e*, are ſimilar: and the line of traction paſſes through the centre of gravity of the figure, they conſtitute. But as the obſtacle upon the ſhare, &c. occaſioned by cutting, and raiſing the furrow, &c. is ſo very great, as almoſt to equal the effort of the whole moving power, there is the greateſt

greateſt neceſſity to provide further againſt that bias, by continuing the beam O, to the greateſt diſtance, the conveniency of the inſtrument will admit of; (which, I humbly preſume, is at P); and there letting fall the prop or fulcrum *r*, with its wheel *q*, whoſe diameter ſhould be the greateſt, which the ſpace between the top of the furrow that is to be cut, and the beam, will admit of. Becauſe the force, required to draw a wheel over an uneven ſurface, is inverſely as the ſquare root of the diameter of the wheel.

What is farther neceſſary to be ſaid relative to the explanation of the appendage of this wheel, (as the uſe of the appendage is chiefly for regulating the depth of the furrow, &c.) I ſhall defer until I come to mention the other regulating parts: and I ſhall proceed now to explain the method of abating the friction of the coulter, ſhare, and parts concerned in turning the furrow, as follows.

The edges of the coulter, and ſhare, as they cut the furrow from the ridge, ought to be placed at ſuch angles, as would give them the greateſt advantage: which might be aſcertained preciſely, were the velocity of the moving power, and the reſiſtance of the ſoil always of one tenor. But as there is no certainty to be obtained with regard to the degree of velocity, the plough may

have; nor an unvariableneſs in the reſiſtance of ſoils; it will be uſeful to attend a little to practice, as well as theory, in order to hit upon the beſt general poſition for the cutting parts to be laid to: and the reſult of my endeavours for that end has determined me to fix upon an angle of forty-nine degrees with the horizon, or plane of the plough, as *d*, *u*, in the figure, for the edge of the coulter to be laid to.

The coulter, beſides this angle, I preſume, ſhould, likewiſe, have its point, that is as much of it as goes within the ground, bent ſideways to an angle of above ten degrees; the point inclining to the furrow. The uſe of this ſideways angle is to cauſe the furrow to riſe with more eaſe, by its being cut rather from above the land than from below it, as is too often the caſe in practice: the coulters being generally ſet to an angle of about the ſame quantity in the contrary direction; which muſt wedge the coulter againſt the land-ſide of the ridge, as the ſhare raiſes it up. Beſides this advantage, another no leſs material will be obtained by the coulter's being bent to the above angle, with its point to the furrow-ſide, as aforeſaid. For, when the furrow, with its under-edge, comes in turning to reſt upon the bottom of the trench cut angularly, it will be quite free from bearing upon the other edge, until the furrow be laid

laid in its proper poſition: which abates the reſiſtance againſt the wriſt-board of the plough, very conſiderably: and, in taking up lays, will prevent the furrows from falling down. Becauſe the angle, which the coulter at the edge of the furrow lies undermoſt to, ſerves to reſt it upon; and the center of gravity of the furrow being without the perpendicular, the angular point ſerves as a fulcrum to counteract the elaſticity, and ſpringineſs of the turf.

The ſhare, in courſe, falls next to be conſidered. The figure, to render it the moſt complete for cutting, and laying an equal ſtreſs on the plough, when a thin furrow is to be cut, and the ſoil yielding, would be ſuch a curve, as *a*, *b*, *c*, Fig. 2d.

But, as ſtiff or gravelly ſoils require the ſhare to be pointed, I have found the figure, which ſuits beſt in general, to be ſuch as *a*, *d*, *c*. Though, however far it may be found neceſſary to alter the point of the ſhare in regard to length, or taperneſs, at all events the fin C, ought to beheld the full width of the furrow, eſpecially in taking up lays, in order to cut the furrow clear thorough. Otherwiſe a part of the land muſt be torn up by the wriſt-board of the plough: which retards the motion very conſiderably; and often leaves ſlips of land unmoved, in a manner not only unſightly, but detrimental.

The furrow being now cut, the method to turn it completely at the leaſt expence of force ought next to be pointed out. And that ſort of wriſt-board, which I have found to anſwer beſt, is, a compound inclined plane whoſe baſe lies horizontal; and whoſe hypothenuſe ſubtends an angle thereto of nineteen degrees. The perpendicular ought to be a fourth more than the width of the furrow; and the greateſt or extreme projection at the haunch from the land-ſide of the plough, taken upon a horizontal line, ought to be one third more than the width, and the thickneſs, of the furrow that is intended to be turned. The furrow-ſide of the chip ſhould be made exactly parallel to its land-ſide, and in width eight-tenths of the width of the intended furrow. Nothing more is to be done to complete the wriſt-board, but to work it to a regular twiſt from the point of the ſhare to the haunch or extreme point of projection; to which the ſhare ſhould truly correſpond, as far as it extends: and, if of that ſort commonly called pan-ſhares, they may eaſily be made to anſwer this purpoſe. Thus a wriſt-board may be conſtructed, which has all the requiſites for turning a furrow, without any unavoidable reſiſtance, or preſſure.

The principles, the above are deduced from, are as follows, viz. the angle which

anſwers to one inch of riſe in three inches of breadth nearly nineteen degrees, cuts the perpendicular at the point, where the furrow, by its center of gravity, begins to diverge; being projected by the extreme point, or haunch, the full diſtance of the width of the trench, or furrow; and the thickneſs thereof: and, as the furrow is twiſted from the point of the ſhare upon its own edge to the ſaid point of extreme projection, the angle of nineteen degrees continues it upon the compound inclined plane, with juſt ſpace enough, to reduce the elaſticity of its parts: and the ſum of the thickneſs, and width of the furrow, as it is not ſhoved off its place below, muſt, if the under-edge were even, and cut ſquare, put the furrow in equilibrio. But, as it was by the ſideways angle of the coulter cut angularly, and the apex acting as its fulcrum, the center of gravity becomes ſooner in equilibrio. And, leaſt any accidental obſtacle ſhould prevent the work being completed, a third of the width, and thickneſs of the furrow, are allowed over and above what ſeems ſufficient by calculation. And to prevent crumbs of ſoil from ruſhing in upon the body of the plough, a fourth more than the height of the furrow is propoſed: all which, in practice, have their uſes. As I had many wriſt-boards made upon this principle, which,

which, in every kind of ſoil, did the part of turning the furrow very completely, I have been bold to ſay, the conſtruction has all the requiſites for turning a furrow, without any material waſte of force, &c.

Having deſcribed the furrow-ſide of the writ-board, I ſhall next conſider the land-ſide. This, from the point of the ſhare to the tail of the plough, is uſually about three feet long, in the common conſtruction, in which it ſtands parallel to the land, and rubs againſt it in every part: whence a great deal of friction is occaſioned. The reaſon, that ploughmen give for the chip, or ſhare, being continued to ſuch a length, is, that it gives the plough *ſteadyment* as they call it. But, from experience, I can affirm, that a plough, when other matters are ordered as above, goes as ſteady when its land-ſide is but half that length. By thus ſhortening the land-ſide, the friction is made ſo inconſiderable, that it is not worth providing againſt, by a friction-wheel, &c.

The friction, which the bottom of the plough, as it is called in the common conſtruction, makes, comes next under conſideration: and I propoſe to abate it, by converting the bottom into a wheel-carriage, in the following manner. (This I tried ſixteen years ago, with ſome ſucceſs, though

not in the way here deſcribed; and one of the ploughs is now in being, that was made at that time.)

The part of the ſhare, and thoſe parts of the chip or ſoal of the plough, which are within ground, are loaded with the reſiſtance of cutting the furrow, and that of its weight in turning it over, &c. and having the bottom of the furrow, or rather trench, for their baſis, which is generally very rugged, the friction muſt conſequently be very great (as appears by the wear of thoſe parts). Now, as the friction upon a ſledge, *cæteris paribus*, is to the friction upon a wheel-carriage, in the proportion of the diameter of the wheel, to the diameter of its axletree, the longer the wheel, or wheels are, that are applied, and the ſmaller the axletrees, the better: but convenience is the criterion to determine that: and the nearer to the point of the ſhare the wheels are fixed (as the greateſt preſſure is there), the more advantage they will give. For which reaſon, I have them to move on the outſide of the plough: as, within the plough, at a leſs diſtance than eighteen inches from the point of the ſhare, no wheel of a ſufficient diameter to abate friction to any amount, can be placed. The method, I uſe, to apply the wheels at a leſs diſtance from the point of the ſhare, and of a diameter which will abate the

friction above twenty times, is, to paſs a ſtrap of iron X, X, from the chip Y up to the beam. This ſtrap, as it folds below the chip, and is firmly connected to the beam, contributes very much to the ſtrength of the inſtrument: ſince it lies at right-angles to the top of the ſhare. Through this ſtrap, and the beam, is a mortiſe of an inch and quarter ſquare: into which mortiſe, an iron axletree is put in a horizontal direction, and at right-angles to the land-ſide of the plough. On each end of this axletree is put a wheel of two feet diameter, about twenty-two inches apart (from the inſide of one to the inſide of the other). That going in the furrow, is made diſhing a good deal: which prevents its being in the way of the furrow when turning. There is a contrivance to raiſe, or lower any of thoſe wheels at pleaſure, by means of hand-ſcrews, and forelocks. I prefer having wheels of equal diameters to that of a high wheel and a low one: becauſe, the high wheel gains upon the low one continually, and thereby twiſts the plough out of its true direction, if not counter-ballanced by the moving power: which is employing it very improperly.—Upon theſe wheels, the whole weight of the body of the plough, &c. reſts: and, as their centers are nearly perpendicular to the point of the ſhare, and

all the parts of the ſhare are ſo effectually braced up, the wheels become the baſis of the ſhare, and plough; and always keep the bottom of the plough level: hence a furrow of an equal dimenſion in all its edges muſt be formed. It is true, the ploughmen cannot quite ſo eaſily twiſt the coulter to, or from land, by the handles, when wheels are uſed in the above method, as when there are none. But, although this ought chiefly to be regulated by the horſes, &c. yet a temporary agent has its conveniencies; and, inſtead of wrenching the handles, as in the common conſtruction, the ploughman is to ſhove a tiller at B, in Fig. 1ſt, a little to the right, or left, which, by a very ſimple piece of machinery, turns the wheel *q* to the right, or left, as need requires: and, upon the principle, that a three-wheeled cart, &c. turns, the wheel *q* twiſts the head of the beam, and conſequently the coulter into the land, or the contrary, inſtantly, without altering the thickneſs of the furrow: which is too often the caſe in the common conſtruction. The parts concerned in producing this effect, are the block D, which is moveable upon a ſpindle.—The tiller B, which is fixed into this block, but not the ſpindle: and, to this block, is, likewiſe, fixed two pieces of jack-chain N, N, which are connected with the levers E, E, which have their

their fulcrum ſcrewed into the cops or ſtand *r* at F. Their lower ends have mortiſes in them, that take in the ends of the axletree of the wheel *q*, which is round, and ſlides backward and forward in the mortiſes in the cops, which are about two inches long. When the levers are not drawn by the chains, the wheel revolves in a direction parallel to the land-ſide of the plough; and its axletree reſts againſt the ends of the mortiſes at right-angles to the track of the wheel. But, when the tiller B is ſhoved to the right (the perſon who ſhoves it ſtanding between the handles) the lever on the left of the cops will be drawn back at top: conſequently the axletree of the wheel *q* will be puſhed forward at that end; which twiſts the plough from land. Juſt the contrary will be the effect, when the tiller B is ſhoved to the left.

The perforated pieces at the ends of the cops *t*, *t*, and ſtand *r*, are to regulate the height of the wheel to the thickneſs of the furrow, if there be not wheels to ſuit the different depth, that the plough may be required to cut. But, as wheels for that purpoſe are but little coſt, and not above three would be wanted to anſwer a great variety of depths, I would rather recommend uſing wheels than altering the ſtand *r*, &c. becauſe it affects the line of traction.

tion. And beſides, when wheels are kept to anſwer the different heights, the maſter, or his bailiff, by giving out only ſuch wheels as anſwer to the depth the ſeaſon requires, may depend upon having the land plowed agreeably to his own mind unalterably. The pin, as ſeen at the top of the ſtand R, Fig. 1ſt, is to prevent the ſtand from falling out of the mortiſe, when the plough is weighed up by the handles to turn upon the friction-wheels at the ends of the ridges, &c. The other pin ſuſtains the preſſure of the beam when the plough is in work.

Theſe principles, and contrivances, I am convinced, from trial, are practicable; having adapted both to a new plough for denſhiring; which I own anſwers my moſt ſanguine expectation *: and that the further application of them to other ploughs may anſwer the purpoſes of the Society, by proving uſeful to the public, is the ſincere wiſh of their

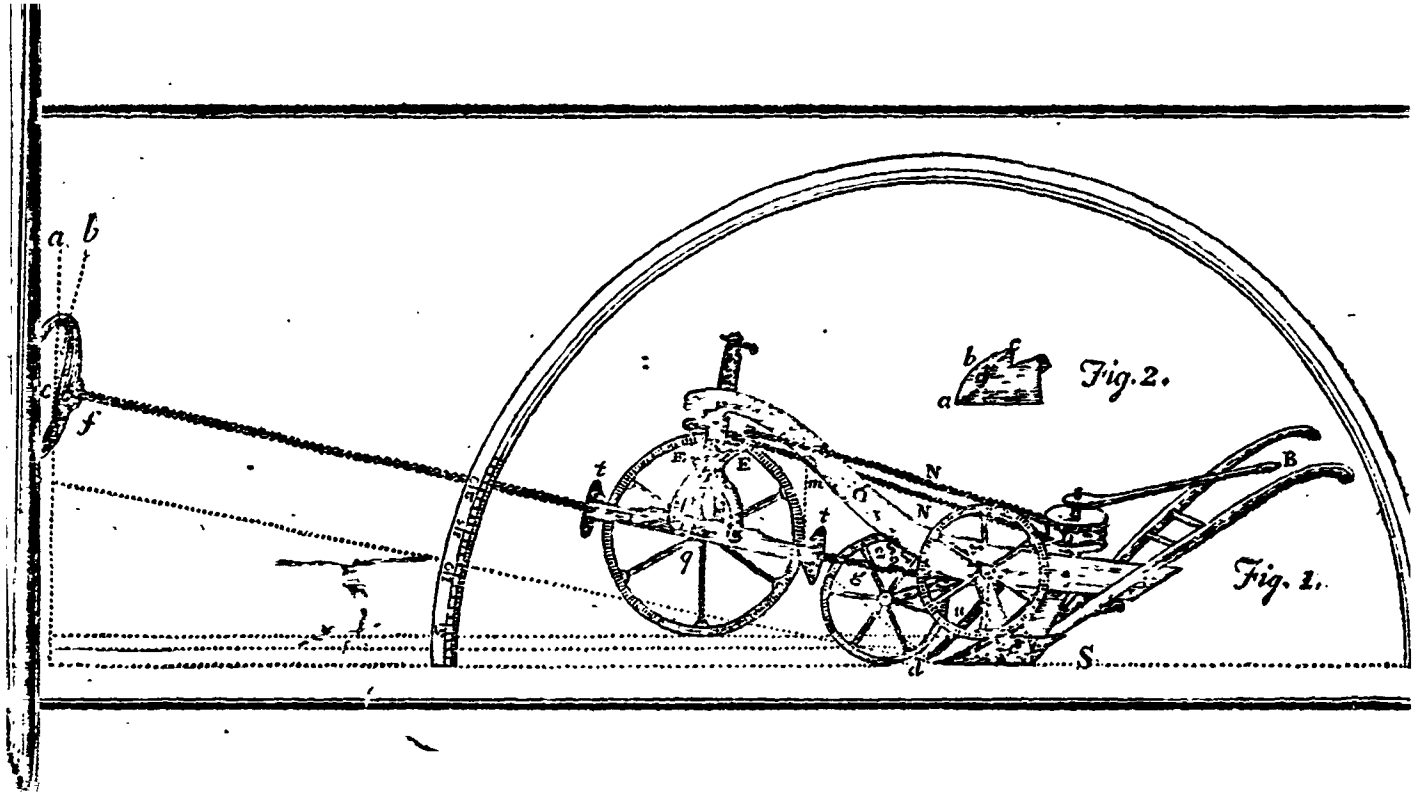
Moſt obedient

and humble ſervant,

February 4, 1771.

C. CLARK.

* One of theſe ploughs for denſhiring is now in the collection of machines in the Society's repoſitory.


a
b
c
f
t
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E
m
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d
Fig. 2.
Fig. 1.

Method to diſcover the comparative Excellence of Wheel-Carriages, by Mr. Clark*.

TO examine this point in the [illegible] required, it will, in the firſt place, be neceſſary to ſhew the beſt height for the wheels of carriages, that are drawn by horſes of a proper ſize and make for carts, waggons, &c. which is generally thought to be thoſe of fifteen, ſixteen, or ſeventeen hands high; and, likewiſe, to exhibit diagrams properly conſtructed, to ſhew how wheels of various ſizes are interrupted by waves, &c. that let ſegments of the wheels ſink below the level of the track, the horſes pull in: as, alſo, how they are interrupted by meeting with ſtones and other obſtacles, that lie above the ſurface of the road. Whence, without ſpending time in prefatory intercourſe, I deſire the eye to be directed to the folio table, Fig. 1ſt; which

* This piece was produced to the Society by Mr. Cuthbert Clark, in claim of a premium offered for diſcovering "the beſt method of aſcertaining the comparative excellence of wheel-carriages, ſo as to determine, which can be drawn upon common roads with the greateſt eaſe, when loaded with equal weights." The premium of fifteen guineas was accordingly adjudged to Mr. Clark, in 1773.

ſhews

ſhews the peripheries of ſix wheels of different ſizes. At the centre of each is marked the number of feet, according to the ſcale (Fig. 6.), of the diameters reſpectively. In the road R, is a wave, or rutt, fourteen inches deep: and its face or obſtacle A, is perpendicular. That part of the road, where the horſe is, I ſuppoſe to be level, or nearly ſo: and, if he be a horſe of between fifteen and ſixteen hands, the beſt point of draught will be about four feet high from the ſurface of the road, if the horſe doth not ſink; and the diſtance from the horſe's ſhoulder to the center of the wheels will be twelve feet. Wherefore, I have directed all the lines, which are drawn from the centres of the wheels, to terminate in a parallel line four feet diſtant from the road: and to determine, which of the wheels will ſurmount the obſtacle A with the greateſt eaſe, I have drawn the radius of each wheel to the point of the ſaid obſtacle. I have, alſo, extended from the centre of each a tangent to the radius; which tangent is the very beſt direction for the line of traction, when the wheel is to ſurmount the obſtacle. Becauſe it is a mean between the centre of gravitation, and point of reſiſtance. But this will more fully appear by turning to note *. (See page 261.) — Now, taking the angles

angles of the ſeveral lines, made 4. 5. 6. 7. 8. 9; and comparing them with their reſpective tangents; will ſhew at once the propereſt ſize under the given circumſtances: that is to ſay, which of them makes neareſt the angle of nine degrees. For this purpoſe, I have taken all of them with a very good protractor, and found them exactly as they ſtand, in the following table, viz.

No. 4, and radius IV. make an angle of 39. Therefore want complement 51.

No. 5, and radius V. make an angle of 45.30. Therefore want complement 44.30.

No. 6, and radius VI. make an angle of 48. Therefore want complement 42.

No. 7, and radius VII. make an angle of 49.30. Therefore want complem. 40.30.

No. 8, and radius VIII. make an angle of 51. Therefore want complement 39.

No. 9, and radius IX. make an angle of 50.30. Therefore want complem. 39.30.

By the table, it appears, that a wheel of eight feet diameter is the propereſt height for horſes of the above mentioned ſize, under the above circumſtances. As all of them deviate in a greater or leſs degree, more from the beſt angle of the line of traction, than the eight-feet wheel does. No. IV. V. VI. VII. being too low; and No. IX. being too high. For even, at the moment

moment the nine-feet wheel comes in contact with the obſtacle, it falls thirty minutes ſhort of the eight-feet wheel: and, when it advances to about one-third of the arch, i. e. at 2, the radius, or lever ſhortens: and alſo part of the effort of the horſe is ſpent contrary to art, by putting the carriage down upon the obſtacle. The conſequence of which is, it increaſes both friction, and weight.

The next thing to be attended to is, to examine by the ſame method, which wheel ſurmounts obſtacle B, in Fig. 2, with the moſt eaſe. The top of the obſtacle is ſix inches above the level of the road (every other circumſtance the ſame as in the former caſe). By taking the angles in Fig. 2, with the protractor, they ſtand as follows, viz.

No. 4, and radius IV. make an angle of 57°. Therefore want complement 33°.

No. 5, and radius V. make an angle of 61. Therefore want complement 29.

No. 6, and radius VI. make an angle of 63. Therefore want complement 27.

No. 7, and radius VII. make an angle of 64. Therefore want complement 26.

No. 8, and radius VIII. make an angle of 62.30. Therefore want complement 27.30.

No. 9, and radius IX. make an angle of 61.48. Therefore want complement 28.12.

In

In this caſe, a wheel ſeven feet diameter, gives the line of traction the beſt direction. Whence, I beg leave to obſerve, that, as there are in general on all roads obſtacles of this ſort, as well as waves and ruts, it appears reaſonable to provide againſt the one, as well as the other. I humbly preſume, therefore, that, as the ſeven-feet wheel has equally the advantage in this caſe, as the eight-feet wheel had over it in the former caſe, (and on other accounts, which will be hereafter mentioned) that a wheel of ſeven feet diameter is the beſt ſize for general uſe.

It may, alſo, be demonſtrated, that, in rough and uneven roads, the force to draw wheels will be inverſely as the ſquare root of the wheels diameter when the radius does not exceed the perpendicular height of the beſt point of draught, on the horſe's ſhoulder. A wheel-carriage, therefore, with wheels ſeven feet diameter, will take only about four-fifths of the force, to move it on the obſtacle A, Fig. 1: which a four-feet wheel will require. But I ſhould not be underſtood to mean, that there is abſolutely a gain of one-fifth of the whole neceſſary force to draw the carriage over the obſtacle. This would be acting in direct oppoſition to an immutable law of nature, and mechanics; viz. that what is gained

gained in power is always loſt in time. So that, although the ſeven-feet wheel is beſt ſuited to overcome obſtacles under the given circumſtances, it ought to be conſidered, and acknowledged, that the horſes combat longer with the reſiſtance of the obſtacle, when the carriage has high wheels, than when they are low, (if not in the extreme, and the line of traction is as well directed, as appears by the quantity of the arches AB, Fig. 5.) This is an abatement of the advantage peculiar to high wheels. — It would be pretending to make action more than re-action, to make any other calculation: which, while the preſent ſyſtem of nature endures, will in all caſes be equal. It is for want of duly attending to this axiom, that the world has been ſo teazed with perpetual-motion-men, and wheel-carriage-magicians, in all ages. For all that the beſt mechanic upon earth can do, is to give time for power, and vice verſa; and, at the ſame time, preſerve the beſt line of *traction*, or *direction* for the moving power, and conſiſtently abate *friction*.

It is upon this principle, that wheels of nearly the ſame radius of the height of the beſt point on the horſe's ſhoulder for draught, is preſumed to be the beſt for general uſe, as above ſaid. And, although the horſes do combat the reſiſtance of the obſtacle

obſtacle ſomewhat longer, they are thereby enabled to overcome the reſiſtance analogous to a man, or any other agent, lifting by a crane, or any other ſpecies of lever, bodies which much exceed their own weight; and which, they never could do, were it not for the machine. This advantage, and what ariſes from the beſt poſition, from the line of traction, and the abatement of friction, are perfections more than ſufficient, I hope, to overcome the prejudice of cuſtom. Eſpecially, as all the perfections of low wheel-carriages may be preſerved (even not being ſo liable to be overturned, and the ſtopping down hill, &c.) without any inconvenience to the carriage with ſeven-feet wheels.

In the next place, I ſhall make ſome remarks on four, and two-wheel carriages. Firſt, of four-wheel carriages. It is common to have the firſt wheels low, that is, leſs in radius than the beſt point of draught; or than the horſe's ſhoulder is diſtant from the plane of the road (by more than ſix inches, on the height of common obſtacles, which lie upon roads): which, by the foregoing principles, appears to be a defect of great magnitude: and if it be a defect in the firſt wheels, it muſt, for the ſame reaſons, be ſo in the laſt wheels. And ſo would their being higher than the firſt, when conſtruct-

ed

ed as above mentioned: becauſe, on the plane, and up hill, the line of traction would be falſe: whence, the inconveniences above mentioned, relative to a falſe poſition of the line of traction, would obtain. It has been pretended, that fixing the ſhafts, or pole, in the true poſition of the line of traction, whether the wheels are high or low, would anſwer full as well. But this will be found a deception; of which a full demonſtration is added at the end of this paper (ſee page 265).—Waggons, and other four-wheel carriages, are liable to great inconveniencies from the laſt wheels, and the whole machine depending upon the ſwivel-bolt. For when any obſtacle comes in contact with the laſt wheels, if the carriage be loaded, and the obſtacle be material, the wheels may be, and often are thrown out of the true parallel direction; and thereby diſtreſs the horſes. Four-wheel, and indeed all wheel-carriages, ought to have the horſes, &c. keep as near the firſt wheel as poſſible. Becauſe, when they come to pull at a great diſtance from the wheels, the line of traction is diſtorted (as appears by II. III. IV. Fig. 4.) where the wheels are left on one ſide of the ſummit of the bank, or hill X, and the horſes on the other ſide thereof. In this caſe, the line of traction deviates widely

from its true direction: by which, not only much power is loſt, but the ſhaft-horſe is oppreſſed, by the draught of the firſt horſe. It is unneceſſary to give trouble by a recapitulation of what has been remarked in the preceding pages, relative to this ſort of defect; but I ſhall conclude with an obſervation, which agrees both with theory and practice, viz. that the leſs diſtance the power is, from the load, or carriage, the fewer the inconveniences. And, therefore, horſes put in pairs are better than put ſingly, except at plough, in ſome caſes, where pairs would poach the land, &c. It is, alſo, obſervable (contrary to an opinion, which has too long prevailed) that four-wheel carriages, have no advantage in point of draught over two wheel-carriages. For, although the load of four-wheel carriages is divided into four parts, and that of two-wheel carriages only into two; yet there can be no advantage: as the obſtacles are ſo many times oftener to be ſurmounted. The ſurplus of friction, which is incumbent on four-wheel carriages, is, alſo, a very great detriment: and to prove that there is a greater quantity of friction ariſing from four wheels, than two wheels, every thing elſe being the ſame, we have only to take the diſparity of the number of parts, and the velocity under conſider-

ation: the reſult will be, that nearly, if not altogether, twice the quantity of parts are in action. And I have found, that friction is increaſed by augmenting the quantity of ſurface of the parts in action. The contrary of this doctrine has been advanced by authors, as true theory: but, in that reſpect, I beg leave to ſay, they have been too general. For, in this caſe, it is to be contradicted, even by the very principles, ſuch authors have laid down, as the true criterion whereby friction may be eſtimated, viz. the weight of the body, which is to be moved; and the degree of ſmoothneſs, and aſperity. Now, as the parts of wheel-carriages, which are in action, and from which the friction ariſes, viz. the buſhes of the wheels, and pivots of the axle-trees, have, from their peculiar texture, many prominent parts, and concavities, which lie promiſcuouſly ſcattered all over their ſurfaces, not in lines, thus ⋮⋮⋮ as their theory ſuggeſts (if it be not altogether abſurd); and ſo reſiſting all at the ſame time; but thus ⁘ : and, therefore, the motion is interrupted by the more frequent junction of the prominent and porous parts of the pivots, and buſhes. And as any one of thoſe prominent, and concave parts, is at leaſt half as great an obſtacle,

as if twenty hooked at the ſame time, or even a whole line from the ſhoulder to the end of the pivot, were in junction, *(cæteris paribus)*, it may reaſonably be concluded, that friction is at leaſt one fourth more in four-wheel carriages, than in carriages with two wheels. The axle-trees, and every other thing, being equal, it remains to make a comparative eſtimate of the advantage, which carriages of two wheels have over carriages of four wheels: or, which carriages of four wheels have over thoſe of two wheels, impartially from the view, which has been taken of their peculiar conſtruction, &c.: which, I ſhall faithfully endeavour to do, and as briefly as I poſſibly can. 1ſt It follows, from the foregoing obſervation, that there is leſs friction, and that the line of traction is not ſo liable to be falſe in two-wheel carriages, as it is in carriages with four wheels; both on account of the number of wheels, and number of horſes. For it is always deſigned to carry greater loads on waggons, &c. than carts: which inevitably occaſions a longer team, that when moſt wanted, is always under the greateſt diſadvantages with regard to that very material circumſtance, a true poſition of the line of traction; and, at the very inſtant, when this great loſs of power obtains, a four-wheel carriage has the obſtacles to ſurmount twice as often as a two-wheel carriage.

riage. Beſides, waggons are generally heavier in proportion to the loads a proportionate number of horſes can draw in them, than carts are: all which makes againſt the uſe of waggons, or four-wheel carriages, when uſed on common roads, where ſuch obſtacles, as are mentioned in the preceding pages, are to be met with; unleſs where it is for the convenience of conveying commodities which cannot be loaded into carts; or where they may be uſed in champaign roads, &c. on which the vaſt quantity of goods, that can be ſtowed, may employ eight horſes at the expence of one driver. Whereas ſuch carts, as I humbly preſume, deſerve the preference, in this particular ſituation would require two drivers: but theſe two drivers will have it in their power, to give better attendance to the horſes, which might, even in this particular caſe, anſwer a better account than driving eight horſes at the expence of one perſon, or driver.

The kind of cart, I beg leave to recommend, is to be drawn by three horſes. One of them in a pair of ſhafts; and the other pair as near the ſhafts, as poſſibly they can be fixed; taking care, to allow the ſhaft-horſe full liberty, to exert himſelf. The pair ſhould have their chains, or traces, hooked to ſingle whipns; and thoſe whipns be connected to the ſhafts, at ſome place oppoſite the flexure, or elbow of

the ſhaft-horſe's fore-leg; and to project as far from the ſhaft, as will bring the place of connection parallel with the outer buſh of the wheel; from whence a chain, or ſtrap of iron, ſhould be ſtretched to the eye or hook, which projects out of the ſhafts, as above deſcribed. This enables the firſt horſe to pull immediately at the point of reſiſtance; and prevents the obſtacles from gaining any powers to cant the wheels out of their parallel direction, at the ſame time, the ſhaft-horſe pulls between the extremes; and probably at or near the line of percuſſion. The ſhaft-horſe ſhould be in traces, as well as the pair; and his traces, or chains ſhould be hooked to the ſhafts near the bar, at a place directly in a line with the centre line of the axle-tree; through which, the ſhafts ought, alſo, to paſs, and bolt; or be otherwiſe connected. The ſhaft-horſe ſhould have a band, to keep his traces bent to an angle of ten degrees from the place where the band acts, to the point where the chains hook to the harneſs. All horſes ſhould be thus harneſſed; for it gives great power to them, in their work, by bracing the cheſt, which, in the action of drawing, is ſomewhat neglected by the tenſion of the muſcular ſyſtem being employed in another direction, &c. Thoſe particulars ſhould be carefully attended to, and the cart furniſhed with wheels, whoſe radius does not exceed the

per-

perpendicular height of the beſt point of the horſe's ſhoulder for draught, from the plane of the road; but rather falls ſix inches ſhort of it, viz. wheels about ſeven feet diameter; and laying a convenient part of the weight to the ſhaft-horſe's back, viz. not more than one hundred weight in any ſituation, nor leſs than half a hundred at any time; and having the pair, which draw before, at leaſt the ſame ſize of the ſhaft-horſe; and the axle-tree the leaſt diameter poſſible to bear its load, &c. without bending. The wheels ſhould move parallel to the line of traction, and perpendicular to the line of gravity of the load; and the load ſhould be kept as narrow as poſſible, that is, as much in the middle of the cart longitudinally, as may be. A cart or carriage conſtructed, and occupied in the above manner, will exceed, in point of eaſe of draught, any four-wheel carriage in common road; and *(cæteris paribus)* vie with any other conſtruction whatſoever. In the above eſſay, there is but too much occaſion to apologize for defects; the principles excepted: they, I preſume, will always be found juſt. I cannot, therefore, do better than acknowledge the truth; which in my ſituation is ſuch, that I have not had opportunity either to copy, reviſe, or improve it. This fact, I truſt, will be allowed to plead as an apology for preſenting ſo crude a piece.

Note *, referred to in page 251.

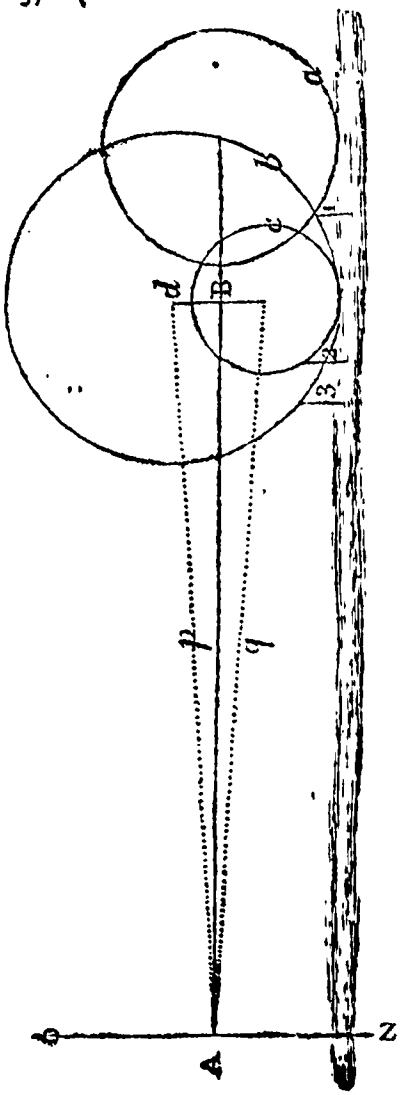
Theorem to demonſtrate the beſt Line of Traction

Let APGEM be a wheel, (ſee Figure 3d, whoſe weight is W, radius CA equal r, and EF equal *h*, the perpendicular height of an obſtacle E: over which, the wheel is to be drawn. Let OK be a tangent to the wheel, at the point E the top of the obſtacle, meeting the diameter AG, produced in O. Then the wheel coming to the point E, ſtands upon G; preſſing it with all its weight. Let, therefore CO, the direction, in which the wheel gravitates, expreſs its whole weight; which is reſolved into the two forces CE and OE: of which, CE preſſes directly againſt the top of the obſtacle E; and ſo is deſtroyed by the re-action of the obſtacle. Therefore, the only force to be overcome is OE. Whence, becauſe wheels are drawn by axletrees through their centers, it follows, that a force equal OC, in the direction of CM, parallel to EK, will hold the whole in equilibrio on E. So its ſimilar angles, as EO : CO :: HE : EC. Whence $EO = \frac{W}{r} \times HE$: but, by the property of the circle $\square HE$, $= AH \times HG = 2rh = hh$. Therefore $EO = \frac{W}{r}\sqrt{2rh}$, the wheel in direction CM parallel to OEK, is drawn with the greateſt eaſe.

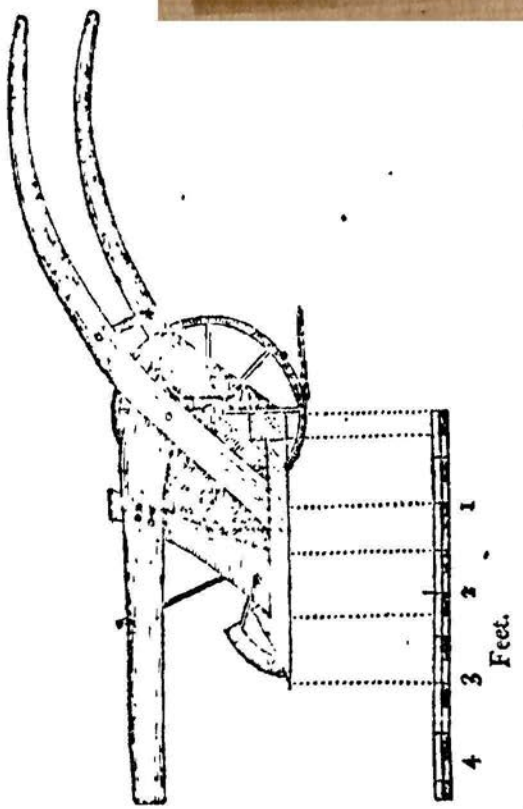
Method

Method to discover the error of fixing shafts, or poles, either above, or below the centers of the wheels, &c. referred to in page 257.

Let AB, in the fig. annexed, represent the true line of traction of the wheel *a*; and, also, the pole, or shafts of the wheels *b c*, instead of their respective central lines *p*, *q*. The consequence will be, when the line AB is substituted for the dotted line *p*; and the periphery of the wheel comes in contact with obstacle 3; the end A will have a tendency to move in the direction A O, in the ratio of B*d*, to A*d*: as it is, to all intents and purposes, a lever of the third kind. The consequence will be the same, when it is substituted for *q*: only the tendency will be in direction A Z.



Mr. *Peter*'s Letter respecting his Rotheram Plough improved with a circular Coulter.



Newport, Isle of Wight, March 20th, 1772.

SIR,

THE honour the Society of Arts has done me, on occasion of my plough with

with a circular coulter, claims my warmeſt thanks, as it has been the means of furthering my endeavours to promote an emulation among the farmers of this iſle, to improve this uſeful utenſil in huſbandry, the plough.

For, although the circular, or as the farmers here will have it, the cock-coulter, was known by the neighbouring people, where it took its riſe; yet not one in many of the farmers of this iſland could have any idea of its conſtruction, or uſe; nor, indeed, of my ſwing-plough; much leſs how a plough could be formed with a vertical wheel, to bear its weight; till the Society favoured me with their commands. This gave an opportunity of exhibiting and proving it, by trial, not only with the ſmall number of *two horſes*; but with *one* alſo: and the farmer, who held the plough, which was the firſt time that he ever had a ſwing-plough in his hand, declared that he would engage to plough an acre a-day of their common ground with one of his horſes.

This no ſooner appeared ſo evidently ſatisfactory to the ſpectators, than many orders were immediately given to the wheel-wrights, to make more for their own trial: but with this difference, to make them one-wheel ploughs inſtead of ſwing-ploughs; as the ploughmen here are at

at preſent intirely unacquainted with ſuch. However, I hope, it will turn out in the end, to totally extirpate the preſent ſore encumbrances of their plough.

Permit me to mention, that the circular coulter is, in my opinion, the beſt conſtructed for all ſorts of land.—In wheat-ſtubble, it prevents the ſtraw, that never fails to gather in large quantities againſt the common coulter, from giving any trouble; as the ſtubble is equally ſubverted with the furrow; a matter of no ſmall advantage. The ſame, where green vegetables are ploughed in, if they be firſt properly rolled. The ſame again in couch, or dog-graſs land and clay-land, where it equally cuts the turf as the other coulter: and in caſe of flinty land, there is no ſpace, as in the common plough, for ſtones to catch in †.—But, as this plough will work with either coulter, I thought it adviſeable to ſend with it, a ſhare and coulter in the

† The Society made a trial of one of theſe ploughs, fabricated under Mr. Peters's direction, on a piece of ground full of furze-roots. They reſolved, that in this trial "this plough performed its work in a complete "manner; and from the particular conſtruction of the "coulter was not liable to be choaked with the roots, "as ploughs made in the common way;" and reſolved further "to give the ſilver medal to Mr. Peters, for "his ingenious introduction of a circular coulter, for "the purpoſe of avoiding obſtructions in ploughing up "ſtubble and rough ground."

common

common way; which ſhare I could have wiſhed to have been of the ſocket kind; but ſuch, the ſmiths here are unacquainted with. This has made the length a few inches greater than in my draught: which, I hope, the Society will excuſe; as, alſo, any other incorrectneſs in the ſmith's work, being the beſt I could procure here.

The horizontal wheel now added to the plough, *though not in the drawing*, I hope will, alſo be excuſed. My reaſon for adding it was, that the plough may be ſeen complete; and to convince theſe iſlanders, with what eaſe a plough thus accoutered paſſes through the reſiſting earth.—I am afraid that I treſpaſs too much on the Society's time; and ſhall, therefore, only beg leave to add, that, as our annual produce of corn is yearly decreaſing; and, as I apprehend, through the earth's unchangeable aſſiſtance in the old mode of horſe-dung. Huſbandry, I have ſubmitted to the public, a green vegetable ſyſtem, thereby to make a greater change in the manuring ſubſtances; as well as to give freſh ſpirit to the dung-ſurfeited ground. In two publications, intitled Rational Farmer, 2d edition; and Winter Riches, ſold by Flexney, oppoſite Grays-Inn, Holborn; I took the liberty, to addreſs myſelf to the Society of Arts, Manufactures, and Commerce; relying on their indulgence, as being confident

fident of their universal desire of promoting agriculture, let improving hints come from whence they may.—To whom, through you, I beg leave to present my most respectful esteem; and, at the same time, have the honour to subscribe myself,

Sir,

Your most obliged
and obedient servant,
MATTHEW PETERS.

P. S. The expence of making such a plough is, with us, two pounds one shilling.

Mr. *Arrow*'s Account of a construction of an Arch, for preserving Buildings from the effects of fire*.

To the Society for the Encouragement of Arts, Manufactures. and Commerce.

GENTLEMEN,

ABOUT the beginning of the year 1768, a gentleman of my acquaintance had the misfortune, to have his house burnt, and the greatest part of his effects, with many valuable books, curiosities, and manuscript notes, which he had made on a variety

* The Society gave their gold medal to Mr. Arrow for this ingenious, and useful invention.

riety of philoſophical and chemical experiments.

He, wiſhing to guard againſt the like accidents hereafter, conſulted with me, whether it was not poſſible to conſtruct his houſe, which he intended to rebuild, in ſuch a manner as to render the principal rooms ſecure for the future, by arching them; and what kind of arch would have the moſt agreeable form.

We agreed, that the flat arch, commonly called a coach-head arch, for its ſimilarity thereto, would have the beſt appearance: and that this form was moſt capable of receiving ſuch kinds of ornaments, as would totally exclude the appearance of an arch, if it ſhould be thought neceſſary. But there was a material objection to this kind on account of its great lateral preſſure againſt the middle of the ſide-walls; which, in all rooms is the worſt to guard againſt.

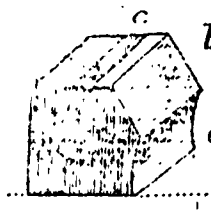
I had read the Count D'Eſpie's Treatiſe on flat Arches; which has great merit: but, at the ſame time, I was fearful of copying him; as his arch altogether depends on the coheſion of the plaſter made uſe of in uniting the flat bricks, it is compoſed of; and which muſt be kept perfectly free from moiſture, with which our iſland too plentifully abounds.

The

The form, however, I liked: and I thought, could I contrive an arch of that ſhape, which would depend on the nature of the ſeveral joints, and manner of placing the materials together, and not on the cement uſed; and at the ſame time guard againſt the great lateral preſſure, or thruſt, of all flat arches againſt the walls or abutments, it would be a very valuable acquiſition to ſociety in general; as an arch of that kind might be made uſe of for thoſe rooms, we ſhould wiſh to have ſecure, which would anſwer the end, and at the ſame time be elegant, by avoiding the diſagreeable appearance, that arches conſtructed in the common manner have.

Theſe thoughts naturally led me to invent the arch, which I now have the honour to lay before you: wherein I have adopted the form before mentioned; and have conſtructed the courſes in ſuch a manner, that the lateral preſſure is taken from off the ſide-walls; and thrown on the angles, which are effectually ſecured by the chain bars: and, in conſequence thereof, the thruſt againſt the walls is *entirely* prevented, and the whole of their office is barely to carry the weight of the materials, of which the arch is compoſed. Fig. I. and II.

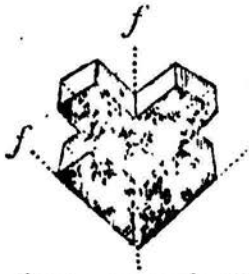
The



The arch is conſtructed as follows. It conſiſts of 1ſt. the abutment courſe, which is a courſe of ſtone laid in the walls of the room for the arch to ſpring from; and forms a part of the arch; *a* the lower part of the face next the inſide of the room, is worked to the courſe of the arch; and makes part of the ſophit: *b* the upper part of the ſide next the room, is worked to anſwer the arch-joints; and tends to the center (*m*), which is in the middle of the room (Fig. 2.), at a certain diſtance below the chord line of the arch; to which center, alſo, every vertical joint in the whole arch tends. On the top of the abutment courſe *c*, is a ſtrong chain-bar of iron, let into the ſtone, and run with lead. It goes all round the room; and acts as a hoop does to a barrel, confining the whole ſtrongly together. The great advantage of this kind of chain-bar may be ſeen by thoſe fixed to the lower part of Saliſbury ſteeple; which (but for them) would have been in ruins long ago.

The tranſverſe joints of each ſide, all tend to one center (*n*), which is at a certain diſtance from without the ſide. Fig. 1.

2d. The courſes of the arch, which are made parallel to the ſide of the room. Every vertical joint *e* tends to the foregoing center (*m*) in the middle of the room; and the tranſverſe joints *d*, horizontally, to the outſide center (*n*), as does the abutment courſe on that ſide of the room againſt which the courſes lie.



3d. The ſtones *f*, which form the groins (*g*), and are a principal part of this arch, are ſhaped horizontally, ſomething like the letter V; by which means, they receive one another, and form an arch themſelves diagonally acroſs the room, from angle to angle, independent of the reſt of the arch; therefore, every courſe being an arch, the lateral preſſure is againſt the ſtones which form the groins; and, by them, is conveyed to the abutment courſe; which, by means of the chain-bar, acts, in regard to each ſide, as a ſtring to a bow, by preventing it from ſpreading.

Every

Every courſe may be conſidered as a double arch. For one way, it is an arch formed to reſiſt its natural tendency to fall to the center: the other way, to reſiſt its lateral preſſure, or tendency to fly out, and force out the ſide-walls. See Fig. I.

The conſtruction of this arch is ſuch, that we may take out any of the ſide-courſes; and the others, either above or below, will not fall down; but remain in their proper places: which they would not do, by the common conſtruction:—or we may take out the whole of one ſide, only leaving the angles, or ſtones, that form the groins; and the remaining part will ſtand unſhaken:—and farther yet, were all the four ſides to be taken away and the groins only left, even the groins will remain permanently fixed in their ſeveral places: which I believe is a property peculiar to this arch only.

I had thought of ſeveral other ways of making theſe arches: but as this is the moſt ſimple in its conſtruction; the eaſieſt for common workmen to execute, (which give me leave to ſay is a very principal conſideration in all works) and fully anſwers the end propoſed; I, therefore, have adopted it as preferable to any I know.

Theſe flat coach-head arches are, alſo, the beſt for elegant apartments, as they

occupy but little height; which gives the more ſpace for making the windows, without being confined to any diſagreeable form: and they, likewiſe, leave the ſides and angles of the rooms perfectly free, and regular; which cannot be effected by the common groined arches. I muſt, moreover, add, that the groins, in the common conſtructed arch, are the weakeſt part, and have a diſagreeable appearance of falling on the ſpectator's head. In this arch, they have the direct contrary appearance and effect; and are in fact, equally ſtrong with any other part of the arch: which is proved by the groins being able to ſtand after all the intermediate courſes are taken away.

The arch is a ſegment of a circle, with a ſmall addition to the ſophit, or underſide, to take off the angle it makes in joining the abutment courſe. I choſe this curve, preferably to the catenarian, or any other, as being the beſt, and eaſieſt to be deſcribed by common workmen; and capable of having all its various courſes, and joints aſcertained with the greateſt exactneſs, and truth; and, conſequently, free from that perplexing intricacy, which ſo frequently ariſes in executing the other kind of curves. For though, in theory, the catenarian arch is eſteemed to be the

ſtrongeſt

ſtrongeſt of all; yet it was an obſervation of the truly great and ingenious Sir Chriſtopher Wren, that the great truth, and preciſion, requiſite in molding every ſeparate ſtone, that forms a part of a catenarian arch, in which each is required to be different from the adjoining, makes it very difficult to be carried into execution, even by the moſt ſkilful and beſt workmen; and, conſequently, very liable to error; and, therefore, he thought, the catenarian arch, when reduced to practice, but barely on a par with the circular one, where every ſtone is of the ſame form; and, conſequently, much eaſier to be executed, and with greater truth, and exactneſs.

I before obſerved, that the coach-head arch might be ſo ornamented, as to exclude the appearance of an arch, if it ſhould be thought neceſſary. Give me leave to explain, what I then advanced, by the annexed diagram, Fig. II. let A, B, C, D, repreſent the line of the arch: then, by running a cornice round the room at A, and forming a cove from thence to B, we intirely conceal the lower part: and the remaining part may be ſubdivided into compartments, by mouldings at C. The center part D may be a pannel, which will riſe up a little above the level of the ſpace between B and C; and will give an

agreeable relief to the ceiling; and effectually take off the appearance of an arch.

There may, alſo, be left an opening, in the middle, or lower part, for a ſky-light, ſhould that light be preferred, on account of pictures, book-caſes, or any thing elſe. Fig. I. *p. p.*

If it ſhould be executed in a much larger room than the model repreſents; it will then be neceſſary to form all the courſes a little camber each way; thereby allowing for the ſinking in the middle of the courſe, when the center is ſtruck, and the whole arch has its proper and final bearings.

In this model, the arch is ſuppoſed to be formed of ſtone; but I am of opinion, that a great part of it may be made with brick; and that the whole may be very well executed in artificial ſtone, which is a ſpecies of brick.

There is one thing more, I would wiſh to obſerve to this Honourable Society; and that is, the guarding againſt the electrical fluids affecting the chain-bar, which may be very eaſily done, by fixing a bar, as a conductor, to guide it in the damp ground, and thereby effectually ſecure the building from lightning.

I hope

I hope, Gentlemen, you will excuſe the length of this explanation, (the ſubject ſeemed to me to require it,) and believe me to be, with the greateſt reſpect and eſteem,

Your very humble ſervant,

JAMES ARROW.

REFERENCE.

Fig I. H. H. H. the head of the arch, ſhewing the parallel and tranſverſe joints, as alſo the chain-bar on the abutment courſe.

o. o. o. The occult lines of the tranſverſe joints, as they vertically tend to the center,

g. Stones forming the groin, which make the principal part of the arch,

p. Parts of the intermediate courſes that can be left open for light or air,

Fig. II. R. R. Section of the arch and room.

A B C D. Shew the manner of finiſhing the ſophit,

i. k. l. Indicate the thickneſs of the arch, and the ſize of the abutment courſe.

m. Center to which every vertical joint in the whole arch tends.

n. Radius of a lateral center to which every tranſverſe joint horizontally tends,

Fig. I.

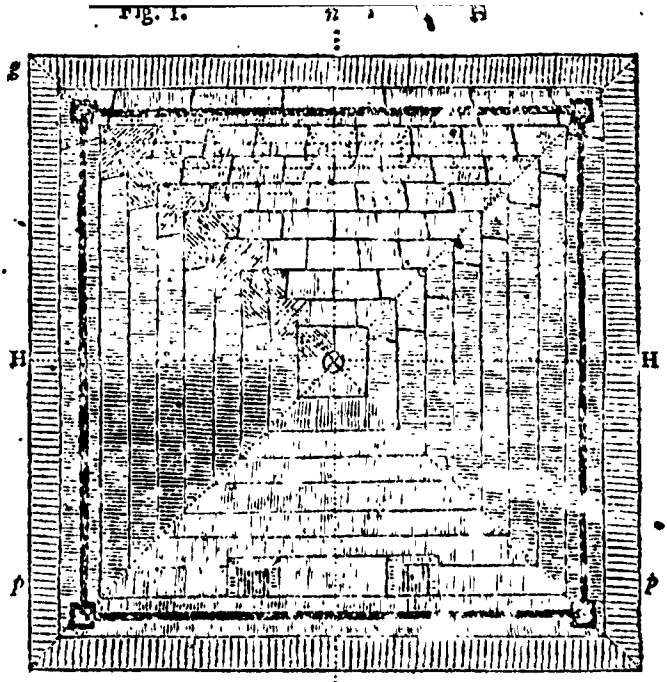
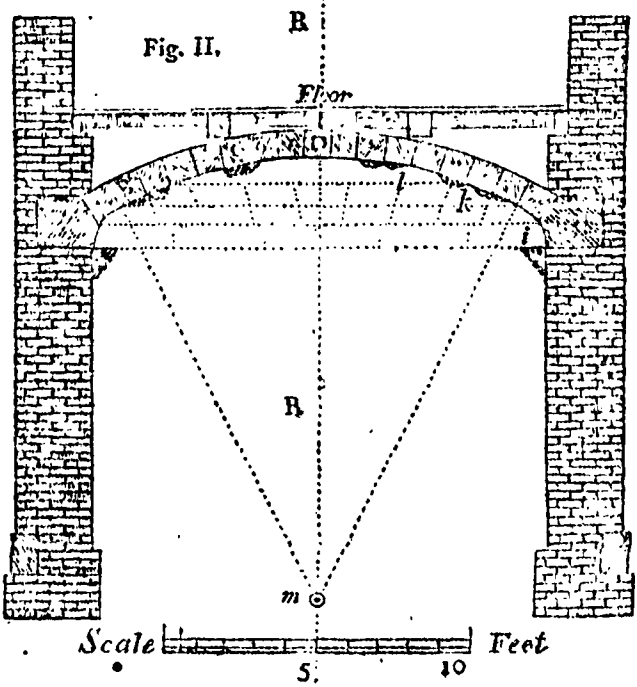


Fig. II.



Account of a cheap and effectual method of making or repairing Banks, to prevent the overflowing of lands by the ſea, or great rivers; by Captain *Page* *.

IT is of the utmoſt conſequence, that people, who have lands near the banks of large rivers, or on the ſea-coaſt, ſhould know how to repair the damages that the floods may do, or the violence of the ſea may occaſion, in breaking the banks, which incloſe lands, that lie conſiderably lower than the high water mark.

Dagenham breach, in the river Thames, was the greateſt accident of that nature, which has happened in this kingdom; and required ſome years, and an expence of near thirty thouſand pounds, to repair it again: This was principally owing to the falſe ſteps taken at firſt to ſtop it: For had proper meaſures been followed, there is great reaſon to think, that one twentieth part of the money, and a few weeks time, would have been ſufficient to have repaired

* The Society, after due examination of this account, reſolved that the gold medal be given to Captain Thomas Hyde Page, for his new, ingenious, and effectual method of embanking; and his public ſpirit in communicating it to the world through the Society.

the

the injury. The method, which at laſt ſucceeded (in that work) under the direction of Captain Perry, was very ingenious, but too expenſive and tedious, to be recommended upon ſimilar occaſions.

The following method has been ſucceſsfully made uſe of in a work of this nature, belonging to Peter Taylor, Eſq. near Portſmouth; where, as it is preſumed, the difficulty was full as great as that of Dagenham breach, and it only coſt about two thouſand pounds.

In order, however, to underſtand this method, it is right, firſt to ſuppoſe a breach of very large dimenſions, ſuch as would require ſome months to ſtop; and that the tide is to run in and out during the operation, and not to be carried out by the means of back ſluices. The work muſt therefore, almoſt always have a ſtream of water running violently over it.

In this caſe, danger ariſes from the caſcade, or falling ſtream, upon the ebb or out-run of the tide.—As to the foundation, it muſt be exceedingly bad to become an object of conſideration: ſince this method ſcarcely admits of the water's undermining the dam, or bank.—The ill effects of the caſcade may be avoided upon all occaſions, by a judicious application of faſcines,

I now ſuppoſe, *a b*, to be a ſea bank againſt which the ſea riſes from twenty to twenty-

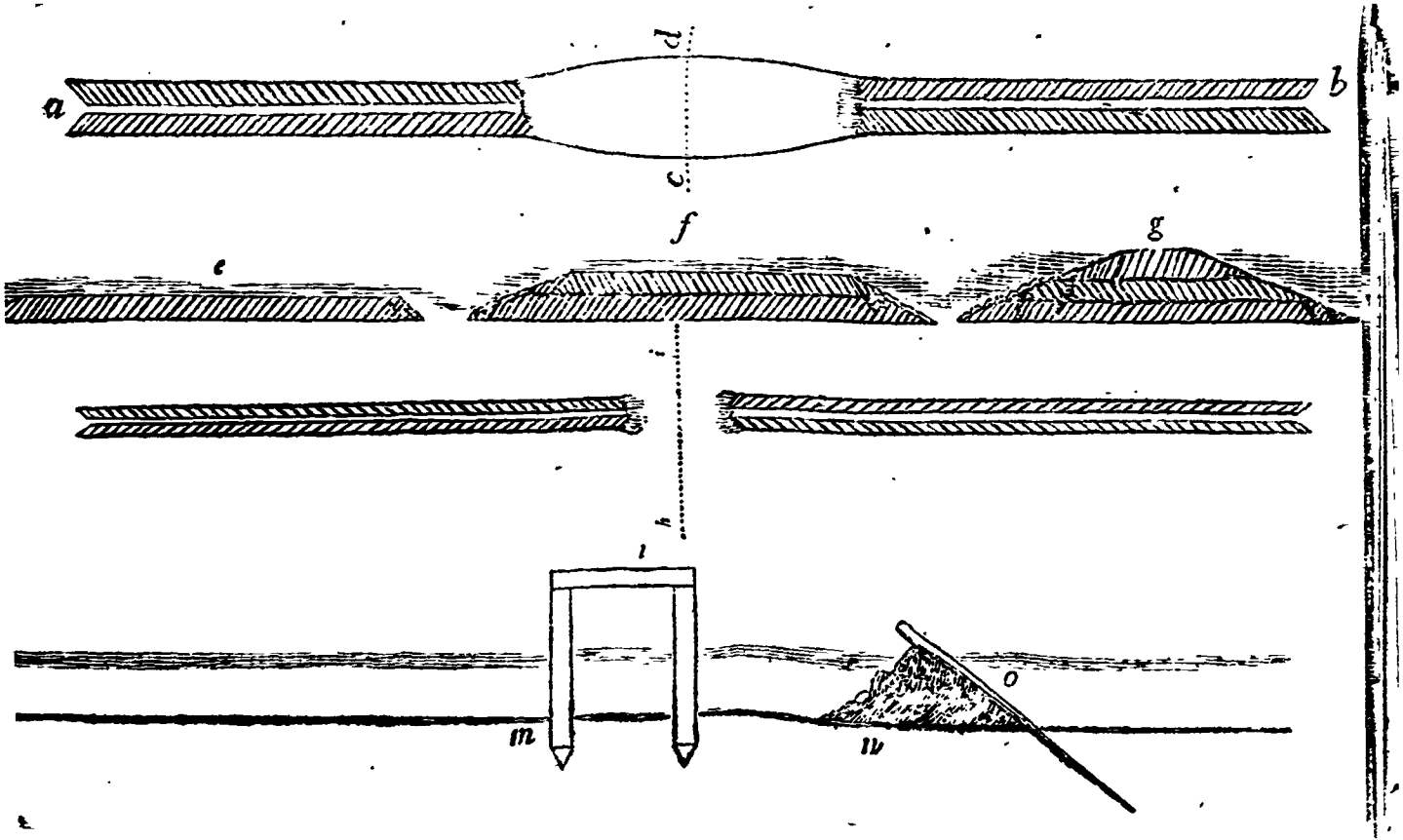
twenty-four feet perpendicular upon ſpring tides;—that there is a breach made in it at *c d* of one hundred yards wide;—and that the run of water in, and out, has cut the foundation away to the common level of land in the inſide.

The ſection *e* ſhews the firſt proceſs of the work; and how the water acts upon it; as, alſo, the hedges of faſcines, that ſecure the interior parts of the dam, which is made of clay, or ſtiff earth, and carried upon a perfect level in all parts. See alſo *n*, *o*.

Section *f*, ſhews the ſame dam carried higher, exactly after the ſame manner as the firſt ſection *e*: except that as there will ſeldom be much fall of water inwards, the faſcine work is diſcontinued upon the interior ſlope, or done in a ſlighter way than on the other ſide, where the fall of water acts with greater violence.

Section *g*, ſhews the dam in its finiſhed ſtate, which ſhuts a great depth of water in upon the lands, that ought to be gradually let out to ſea, by the means of a ſluice for that purpoſe for the finiſhing of the bank, or dam.

The baſes of the outward ſlopes of ſuch banks ſhould, in dangerous ſituations, have, for each foot perpendicular, about four feet; in order to oppoſe as little reſiſtance as poſſible to the waves of the ſea.


a
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I next ſuppoſe a breach, ſuch as *hi* of a more trifling nature, and what ought to be ſtopped in a ſhort time.—The firſt ſtep to be taken, is to make a bridge of plank, or other ſlight materials, for wheel-barrows as at *lm*; after which, a row of ſtakes are to be driven, ſuch as appear in the ſection at *o*. Then a conſiderable quantity of bruſh-wood is to be thrown from the bridge, as the water runs towards the ſtakes intirely acroſs the breach, which will lodge againſt the ſtakes, and force itſelf to the bottom, as at *o*, if they have a great inclination, or ſlope towards the bridge. This will form a kind of ſtill water; upon the appearance of which, clay, or otherwiſe, the ſtiffeſt earth that can be got, is to be thrown into the water betwixt the bruſh wood and the bridge, and to be continued until ſuch time as the dam is entirely finiſhed,

If this method is made uſe of againſt the tide, it ought to be begun when the water runs out: and the dam ſhould be finiſhed before the time of the next high water: and, in caſe that cannot be done, the former method (inſtead of this) ſhould be made uſe of.—When this way is followed to ſtop a breach in the bank of a river, which is not ſubject to a tide, more leiſure may be made uſe of: as, in that caſe, there will be but little danger of a return

return of water before the bank can be completed.

Both theſe methods have ſucceeded in the undertakings of Peter Taylor, Eſq. without the leaſt accident, and with greater effect than could have been expected from any other means.

N. B. Captain Page had a breach of this nature to ſtop, of about one hundred and fifty feet wide, and ten feet depth of water; which was completely finiſhed with one hundred and fifty men, in about eight hours time.

ARTICLE

ARTICLE XI.

Directions for cultivating Aſh on moory, or boggy Lands lying Waſte, by Mr. FLETCHER :—*Account of the Utility of cultivating Winter Vetches, in ſome Letters ſigned a* SHEPHERD :—*Obſervations on the Uſe of a Bull Team, by Mr.* TURNER, *and Mr.* FARINDON :—*A further Account of the Culture and Uſes of the Cluſter-potatoe: and Obſervations on the Proſpect of Advantage in cultivating in England, Maize, commonly called Turky or Indian Wheat, by Mr.* HOWARD : — *Abſtracts of Letters from Lieutenant* HAY, *about his Crop of Spring Wheat, and Cluſter Potatoes: communicated to the* Society for the Encouragement of Arts, Manufactures, and Commerce; *and inſerted at their Requeſt.*

To *Robert Doſſie*, Eſq.

SIR,

THE Society for the Encouragement of Arts, Manufactures, and Commerce, have directed me to deliver to you Mr. *Fletcher*'s directions for the cultivation of Aſh ;—Two letters on winter Vetches, ſigned a *Shepherd*; — Mr. *Turner*'s, and Mr.

Mr. *Farindon*'s letters on the uſe of a Bull Team;—Mr. *Howard*'s letter on the Cluſter-potatoe, and Indian or Turky Wheat;—and the abſtracts of Lieut. *Hay*'s letters about his crops of Spring Wheat, and the Cluſter Potatoe; in order to their being inſerted in the Memoirs of Agriculture, if you think proper.

I am, Sir,

Your very humble ſervant,

SAMUEL MORE, ſec.

To the Society for the Encouragement of Arts, Manufactures, and Commerce.

Hawling, 19th March, 1772.

GENTLEMEN,

SEEING your Premiums offered for Land lying waſte, and for the culture of Aſh timber, I have here offered ſome hints on the above articles; which are actually founded on my own experience: hoping they will prove ſerviceable to your laudable, ever to be admired, and uſeful deſigns.—The calculation is formed for one ſtatute acre; and the rough draft ſhews exactly, how to plant one chain, or one tenth of an acre. I am,

Gentlemen,

Your obedient humble ſervant to command,

JOHN FLETCHER.

Directions for cultivating Aſh on moory or boggy lands lying waſte.

On any boggy, or moory land, lay out the beds for planting aſh in ſuch a manner, that, when finiſhed, they will drain the land, as any one may eaſily perceive.—Let the beds be four feet, and the intervals near three feet wide; which, in one chain's length, will make ten beds of a proper breadth to plant on. Make a cut with a ſpade, by a line, along by the edge of each bed, a little ſloping. Then make another about nine inches, in the interval, a little ſloping alſo. After that, divide the turf, ſo cut, acroſs in lengths about eighteen inches long; and turn up the turf, ſo divided, upon the edge of the bed: and it will form a tabling as we call it, like as you ſee in the bed marked A in the ſection. When the tabling is thus laid on both ſides the bed, as ſeen in the ſection, plant them with aſh-ſets, two years old, about the ſize of riding wands; cut them off a little ſloping about nine inches long, and lay them on the beds on the ſides of the tabling, ſo as to have the ſlope near perpendicular, eighteen inches apart all along the table. Then; with the remainder of earth left in the intervals, fill up the beds level to the top of the

the ſets, putting one-half the intervals on one bed, and the other half on the other, till all your beds are finiſhed; leaving the ſets only juſt out of the ground, about nine inches within the outſide of the bed: as the ſection of the bed A ſheweth.—The proper number of aſh-ſets to remain for coppicing on an acre, is near four thouſand five hundred, as you ſee by the bed A; and left angle-ways, as in the plan, if it be for timber, one half that quantity; the middle row of ſpots ſhow how to plant for drawing out in three years to tranſplant elſewhere, or thicken woods, &c. as I always do. They no ways hurt the plantation, and more than pay for all expence of planting and weeding; as you will ſee at large. The black ſpots ſhew, how to plant for coppicing, or for timber; the diſtance along the beds being three feet apart. The circular ſpots are ſuppoſed to be taken out in three or four years.—The expence to plant an acre of moory or bog-peat earth, &c. bedded, as the ſection ſheweth, planted with four thouſand five hundred ſets, is eight pounds eight ſhillings; if the ſix thouſand ſix hundred ſets be added for taking out again, ten pounds ten ſhillings per acre. To weed, and prune one acre for two years, two pounds two ſhillings. So planting, finding ſets, weeding, and pruning complete, will coſt twelve guineas. The profits ariſing from

an acre ſo planted in ten years, which may be depended on, if planted on a moory, or moiſt ſoil, (for that certainly ſuits aſh better than any other land whatever,) will be as follows; taking even numbers:

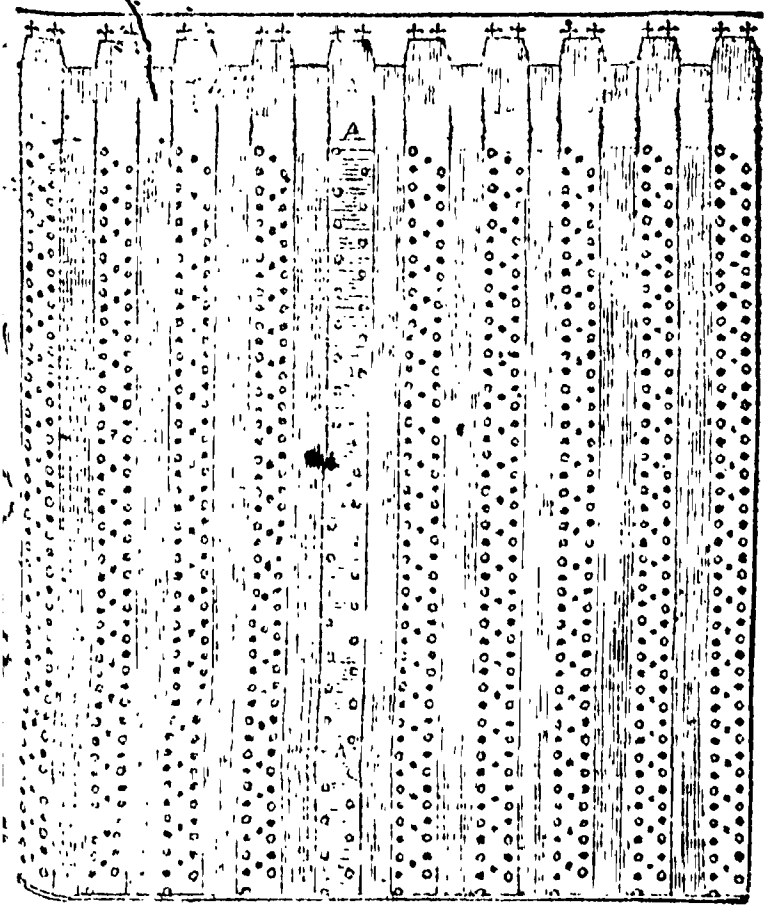
	£.	s.	d.
6000 ſets, to draw in three years, from four to eight feet high, at one ſhilling per hundred - -	30	0	0
4000 remaining for the crop, with them that are for ſtooling, ſhould be cut in ten years at fartheſt, or all, as the proprietor thinks fit - - -	50	0	0
In our county the firſt crop hath been ſold for 50 l. per acre, in ten years. Total produce in ten or twelve years	80	0	0

Some gentlemen do not chuſe to plant the ſix thouſand to draw as above: but, by repeated trials which I have made, I do not ſee it hurts the crop. The above produce, I can affirm may be depended on, if it be on a moiſt ſoil; for I have planted upwards of fifty acres of aſh for different gentlemen, on different ſoils; and always found the boggy make the greateſt produce, and particularly that cutting down the ſets does forward their growth amazingly, over planting otherways, and makes much the fineſt poles, or trees.

Now, Gentlemen, if this account be ſcrupled, as perhaps it may, I will engage to plant twenty or thirty acres in any part of the kingdom, on moory, boggy, peaty,

or

Mr. *Fletcher*'s Method of planting Aſh.



The Society ordered Thanks to be returned to Mr. *Y. Fletcher*, for his Letter on planting Aſh in moiſt and waſte Land. April 14, 1772.

or ſhallow lime-ſtone earth, finding ſets, &c. as above, making allowance for travelling great diſtances: no other ſoil than moiſt, will make the produce as above; but that I will be bound will, if planted as I have directed. If any farther information, on this head, be required, I will wait on the Society in perſon, any meeting they ſhall appoint, by letter directed to JOHN FLETCHER, *at Hawling near Northleach, Glouceſterſhire.*

Account of the Utility of cultivating *Winter Vetches*, to feed Cattle in Spring; from a Gentleman who writes under the Deſignation of a SHEPHERD*.

To Mr. Secretary *More*.

Jan. 30, 1771.

SIR,

KNOWING that the Honourable Society for the Encouragement of Arts, Manufactures, and Commerce, have long endeavoured to procure the public a good green winter or ſpring Food for Cattle; I cannot help recommending to them the winter Vetch for that purpoſe: it has been cultivated in ſeveral parts of Worceſterſhire

* See in this vol. p. 40. A Letter on Syberian Barley, from the ſame perſon.

and

and Glouceſterſhire for ſome years, with good ſucceſs, as I hear: a gentleman from Eveſham told me this Chriſtmas, that he had then winter Vetches higher than his knees. Several farmers of my acquaintance, in Shropſhire, intended, from the good character they heard of the winter Vetches, to ſow ſome of them laſt autumn on their wheat-ſtubbles, but could get no ſeed; one of them did get a little ſeed, but very late, and did ſow it, notwithſtanding his ground was not then in condition, owing to the long heavy rains. A few days ago he told me, he never ſaw any thing look more kind or healthy than his winter Vetches then did. The method propoſed by the Shropſhire farmers for the culture of winter Vetches is, to plow up their hard corn-ſtubbles, and ſow the vetches as ſoon after harveſt as poſſible, eat them off in the ſpring, then prepare the ground for turnips; when the turnips are eaten off, ſow the ground with barley and clover, graze or mow the clover one ſummer, and then break it up for wheat. By this courſe of culture, the ground will be always in crop, always clean, and always in good condition. Several judicious farmers have told me, that they have cleaner and better corn from clover lays, than from fallows. Several gentlemen and farmers in Shropſhire have tried the turnep-rooted Cabbage; but I cannot

learn that any of them approve of it. I have perſuaded two Shropſhire farmers, in two different pariſhes, to try the large Scotch cabbage for ſpring-food; and have got them ſome ſeed, which will be ſown as ſoon as the weather will permit, and afterwards planted out on a deep ſandy loam. I occupy no land myſelf, and am only a ſpeculative farmer. I hope the honourable Society will not think me impertinent; and am, Sir, with great regard, both their and

your humble ſervant,

A SHEPHERD.

To Mr. Secretary *More*.

Feb. 7th, 1771.

SIR,

FROM a converſation I had this week with ſome of my Shropſhire friends, I find, that in my letter of the 30th of laſt January, I ſent the hon. Society for the Encouragement of Arts, Manufactures, and Commerce, an undeſigned falſehood, in ſaying, that a gentleman from Eveſham told me this Chriſtmas, that he had then winter Vetches higher then his knees. The truth is (as my Shropſhire friends aſſure me) that the Eveſham gentleman's winter Vetches were, this Chriſtmas, only about half leg high; and that a gentleman in Warwickſhire

ſhire had winter Vetches, laſt February, higher than his knees. I muſt beg leave to obſerve, that that winter was remarkably open and mild, till about the latter end of February; and that this has been very ſevere, till within theſe few days, both in floods and froſts. I am never better pleaſed, then when miſtakes are candidly corrected, and eſpecially my own. I am quite aſhamed to be thus troubleſome to the honourable Society, but at the ſame time do think, from every thing I can hear of them, that winter Vetches will be very uſeful ſpring-food for cattle. I am, Sir, with the greateſt deference, the Society's and your

very humble ſervant,

A SHEPHERD.

The Secretary was directed, by the Society, to write to the Gentleman who uſes the ſignature of *a Shepherd*, requeſting him to inform the Society, whether the Vetch he mentions in his letter, is the 4th or 5th ſpecies of Vetch deſcribed by Miller in his Dictionary? and deſiring him to give ſuch farther communication of particulars, as he may be acquainted with on that ſubject: in anſwer to which, the Secretary was favoured with the following paragraph, in a letter from the ſame Gentleman, dated April 17, 1771.

SIR,

SIR,

WHEN I had the pleaſure of receiving your laſt favour, I had never ſeen the *winter vetch*, either in plant or ſeed: I have ſent into Worceſterſhire, but can get no poſitive anſwer about the ſpecies. I hope to be able to give the Society a ſatisfactory account of it, the latter end of next harveſt.

To Mr. Secretary *More*.

Octob. 3, 1771.

In anſwer to the above Quere.

SIR,

THE winter Vetches which I ſome time ago took the liberty of recommending to the honourable Society, are Miller's fifth ſpecies, or the *common black vetches* or *tares*. Thoſe my Shropſhire friend ſowed, ſtood laſt winter very well, ſevere as it was; although they were not ſown till the 22d of October, and the ground was then green over with ſquitch graſs. I hope I ſhall be able next year to give the Society a ſatisfactory account of them, as a tenant of mine has ſown this autumn ten buſhels upon a clean wheat ſtubble, of about four acres and a half.

The Thanks of the Society were ordered to the writer, and he was deſired to communicate

municate all farther obſervations he may in future be furniſhed with, relating to the winter Vetch.—Nov. 20, 1771.

Obſervations on the Uſe of *Bull Teams*, preferably to thoſe of Oxen and Horſes; deduced from Practice, by NICHOLAS TURNER, Eſq. and Mr. ANTHONY FARINDON *.

To Mr. Secretary *More*.

SIR,

INCLOSED I ſend you a letter, I had in March two years ago, relative to a Bull Team; ſhowing the utility of ſuch a team, and the reaſon why bulls are preferable to oxen. When I received this letter, I immediately went to ſee the team work, and found every thing true as it is deſcribed. Soon after, within a few days, I bought three bulls, which, with one I had before, made me a very good team. But before I worked them ſingly, I ſent my carter over, who ſaw them in the tills or ſhafts, drove them, and ſaw them carry out dung (very heavy loads) as

* Jan. 23, 1773. The Thanks of the Society were returned to Nicholas Turner, Eſq. of Bignor Park, Suſſex, for the following letters on the Uſe of Bull Teams, &c.

wel

well as horſes.—The harneſs of mine did not do rightly; and the fools began to ſay, *it won't do!* I, therefore, thought it beſt to diſpatch the collar-maker, to ſee how the other team was managed: when he came back, he altered all mine in their way. It has done ſo well ever ſince, that the farmers now think it will anſwer; and one bid me a very advanced price for my team.—My men likewiſe, tho' ever averſe to new faſhions, complain now, that I have not more; as I keep one team of four horſes, and another of four bulls, but never more: Indeed I have a horſe I call Shuffler, that is ridden, draws, goes to mill, fetches calves to ſuckle, and in ſhort is the horſe of all work. By the means of theſe four bulls, and five horſes, I can make three good teams to plow in my land. The firſt conſiſts of three horſes; the ſecond of two bulls and ſhuffler; and the third two bulls and the oldeſt of the cart-horſes, Jolly.—The bulls eat no corn from year's end to year's end; and the horſe called Shuffler ſcarce any: The bulls have eat this year only about two hundred weight of hay, but live on peaſe-haulms, barley-ſtraw, and graſs, yet are always luſty; and, if driven hard, ſoon recover: ſo that, I am fully convinced, I have ſaved, by putting away four horſes, for before I had nine; I ſay I have ſaved for twenty-ſix weeks, twenty-ſix quarters of oats

at

at leaſt, beſides the difference of bulls eating ſtraw inſtead of hay; and ſhoeing the horſes (the farrier's loſs) and other charges. I ſhall alſo (if you will direct your porter to help early to-morrow to my houſe) ſend a new Plough, that has, I hope, ſome merit. All I ſhall ſay of it is, I have tried it, and the *fulcrum* is juſt where it ought to be: but more of that when you ſee it: I beg it may not be ſhewn till I come and explain the draft of it. It has been terribly uſed in bringing up, and I am afraid it is ſtrained. I do not mean to leave it with the Society; but if they chuſe to buy it, they may have it. I ſhall alſo ſend or bring ſeven different ſorts of Wheat; one ſample of Oats, of which I have experiments: I have other things to propoſe to the Society for the uſe of the farmer, which I muſt defer till I come. I hope to be able to attend to-morrow night. If I don't, pleaſe to read Mr. Farindon's letter.

Yours to command,

Newman's-court.

NICHOLAS TURNER.

To

To *Nicholas Turner*, Eſq. at Bignor Park, Suſſex.

SIR,

AT your requeſt have ſent you the beſt account I am able, of my Bull team, which I call myſelf a very good one, and indeed it is the ſurprize of all who ſee them, they doing their buſineſs with ſo much eaſe and pleaſure for what they can double, as every bullock has an opportunity of exerting his own ſtrength without any hindrance, which in my way muſt happen, when not equally matched. I have at preſent ſix bulls, four of them are what I call a plow, ſolely adapted to the farm they belong to; and I am now buying two more, to make up a ſecond team, in the room of my horſes that belong to another farm.—

To ſay how much they will draw, is out of my power; but this I will venture to affirm, that four large bulls will draw as much as any four horſes, when they are thoroughly broken in; and it muſt be expected that they will be like colts at firſt. Yeſterday five of them went for chalk four miles out and four miles home, twice in one day, and brought home larger loads conſiderably, than any of my neighbours horſe teams, though good ones of five horſes

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in a team, and they ſeemed to do it with eaſe. As I never make uſe of a horſe in that team, the bulls go in the ſhafts, the ſame as a horſe, in carts as well as waggons; and I have had a bull-ſtand under the ſhafts of a cart that I am certain had thirty hundred and upwards in it, and he has done the work with pleaſure. We generally work them by turns in the ſhafts, becauſe it brings them to be handy ſooner. We ſhoe them all, which coſts four pence per foot or two pence per claw.

I work them in a ſingle yoke and bow, and in hamwoods and collars; which laſt I prefer, for two very good reaſons: the yoke is apt to wring their necks in wet weather; which the collars do not; and I think, and ſo do both my carters, that they work better in the collar; in ſhort, we have thrown by the yokes intirely. Our collars and hamwoods are the ſame as horſes, only put on topſy turvy, that part being to the dewlap of the bull, which uſed to go on the breaſt of the horſe; and we have them to open at the dewlap, both collar and hamwoods, for the conveniency of putting them on, and ſo laced together by the hamwoods. The Collar ſhould be made a little fuller on that part which goes over the neck, as a horſe's collar is generally thinneſt in that part; which is not ſo well. The Traces

are

are in the ſame place as for horſes, and indeed we made uſe of our horſe harneſs firſt, only cutting the collars, which did very well: but I have gratified my carter with a new fringe harneſs and hoops and bells, with taſſeled halters, not bitted, but the ſame as horſes.—

And now, Sir, if you have but the luck to get a good ſteady fellow for a ſervant, you will find it anſwer your ends in every ſhape. What is very remarkable, both my carters, very gay fellows and uſed to go with the beſt horſe teams in the county, are become ſo partial to bulls, that ſince my firſt team is got to the perfection it is in at preſent, my ſecond carter is harraſſing me continually, to get him two more bulls to complete his team; I ſhall certainly humour him, to get rid of all my horſes, which have eaten up the profits of my farms for ſome years.

It has been objected to me, will not oxen do as well as bulls? I anſwer No! Will a gelding do the work of a ſtone-horſe, or is he ſo ſtrong? will he keep himſelf ſo luſty in hard labour? the gentlemen of the Turf will ſoon convince you, how much ſtone-horſes are ſuperior to geldings in ſtrength and hardineſs: there is no body's ox team that does half the work of my bulls, or that are near ſo luſty: but then my ſervants are very

very careful; and without care, a horſe-team that eats nothing but corn, will ſoon look badly.

Thus have I been as full as poſſible, in ſetting off my bulls to the beſt advantage: but had I ſaid more, it would not have been enough in their commendation: ſo wiſhing you ſucceſs, if you adopt the ſyſtem;

I remain, Sir,

Your moſt humble ſervant,

ANTHONY FARINDON.

A farther Account of the Culture and Uſes of the *Cluſter Potatoe:* and Obſervations on the Proſpect of Advantage in cultivating in England, the *Maize*, otherwiſe called the *Turkey* or *Indian Wheat:* by JOHN HOWARD, Eſq. of Cardington, Bedfordſhire*.

To the Editor:

SIR,

I take the liberty to addreſs myſelf to you, as you have done me the honour to mention me in your Memoirs; from whence

* The thanks of the Society were ordered to *John Howard*, Eſq. for the following letters, communicated at his deſire, to the Society, by *Robert Doſſie*, Eſq.

it got into one of the Magazines; and almoſt innumerable have been the applications. It is with pleaſure I find, by letters from Lancaſhire, Yorkſhire, Glocesterſhire, &c. the encreaſe is far beyond any of the before known ſpecies of Potatoes; though they chiefly uſe them for their hogs, cows, and colts, preſerving their own ſort for eating; and indeed I muſt ſubmit them to the winter whites, even when mine are properly boiled.—I daily uſe potatoe-bread, one third part potatoe and two thirds wheat flour. I think the ſmall degree of ſweetneſs makes them preferable in bread. I am making ſome comparative experiments on the potatoe, on ſome poor, clungey, common field-land, which I let at one ſhilling and ſix-pence per acre, without any manure, and only plowed when they were put in, in March; and to give them all the diſadvantage poſſible, only with the plough turned back the heavy clods to cover them. From half an acre, I had upwards of forty buſhels; a quantity of which I am well perſuaded, not one quarter part of any of the weaker ſorts, could have been obtained in that poor hard ſoil: it is a cleaner neater potatoe than that of the garden, and perhaps it may be found to exceed them, as the field turnep does the garden turnep. In my return from the Weſt of England, I found a letter from Mr. More of the Society,

Society, which informs me of the honour they have done me, in adjudging me their gold medal: permit me, Sir, through you, to preſent my very great acknowledgment and ſenſe of the additional obligation farther to contribute, in the ſmalleſt degree, to the happineſs of our fellow-creatures: a motive which the teſtimony of ſo reſpectable and learned a body renders moſt highly acceptable and pleaſing. I beg leave to remain with great eſteem,

SIR,

Your moſt obedient ſervant,

JOHN HOWARD.

P. S. I beg to ſubmit the incloſed paper to you, if you think it worthy of notice: as the receit is ſo ſimple and plain, I hope there is the greater probability of its being uſeful.

SIR,

IF you think this paper worthy the notice of the Society, by being made uſeful even to one poor family, I ſhould rejoice to be that inſtrument in the hand of Providence. About two years ago, I ſpent ſome time in the Milaneſe (the northern part of Italy). I there met with a ſpecies of bread made chiefly of Indian or Turkey wheat, which, with milk, was the chief food of

moſt of the peaſants and artiſans in and about Milan. I was myſelf fond of it, uſeing no other bread whilſt I was in that country. As I had raiſed it in warm ſummers in my own garden, but knew not the uſe of it, neither did I ever hear of its uſe in England, till very lately, if that may be called ſo, its being ground down for hounds. The bread is made in the following manner: to forty-eight ounces of the Grand Turk, as they call it, being the fine flour, two ounces of rye flour are added, as it will not adhere without it; twenty-one ounces of leaven, made of the flour mixed with water, and ſtanding twenty-four hours; to the above quantity the baker always put in, at two different times, a pint and a half of warm water, and let it ſtand one hour to riſe; after which, putting a little rye on his hand to prevent its ſticking, he divided it into ſaleable cakes of twelve ounces and a half, made round and about an inch and a half thick in the middle. Another ſort of bread was made as follows:

24 ounces Grand Turk
12 ounces Rye
6 ounces Miller,

worked up as the other, with warm water, and let to ſtand one hour to riſe before it be put into the oven. It requires more baking than common bread, as it is moiſter, and becomes better when ſtale, at four days old.

In

In that country, when the weather is very cold, it will keep eight days, but not otherwiſe: from half an hour to three quarters, according to the heat of the oven, the cakes or ſmall loaves muſt continue, to be properly baked. The comparative weights and value I ſubjoin, for I carefully weighed the loaves after they were baked, as I did alſo the quantities prior to their being mixt up for baking.

A ſous value of bread, 5 ounces of wheat flour.
A ſous value of bread, 12½ ounces of Turkey wheat.
A ſous value of bread, 12½ ounces of that mixt with rye and millet.

Twelve ounces is a pound all over Italy, ſo that the poor have more than a pound of bread for leſs than a half-penny, as

21 ſhill. in a guinea	34 livres are equal to a guinea,
24 half-pence	or Louis d'or
—	20 ſous to a livre.
84	—
42	680 ſous in a guinea.
—	

504 half-pence in a guinea.

With us the fine bread is three half-pence per pound; the quartern loaf, weighing four pounds and one quarter, coſts ſix-pence three farthings. The ſecond is only one twelfth cheaper; or one penny in the peck-loaf; and in that reſpect, their poor have the advantage over our poor. I doubt not, thouſands of poor families would rejoice, could they have a wholeſome

ſome and palatable bread at the reduced price of one-third of what they now pay for the brown bread. Commiſerating the hardſhips our country labourers are ſtruggling with, by the high price of proviſions and fuel; and the too general deſtruction of cottages, I ſhall rejoice if this paper is ever made ſubſervient to their benefit; as I now hope, my former has been to many families of induſtrious hard working men, who have little elſe but bread and potatoes to ſubſiſt on. I am,

Sir,

Your moſt obedient ſervant,

Cardington,
Jan. 17th, 1772. JOHN HOWARD.

P. S. I forgot to mention I often eat ſome good puddings made of that Turkey wheat.

I muſt alſo relate the Italian manner of cultivating the Turkey or Indian wheat. With them they ſow it not before the latter end of April or beginning of May, moſtly in drills by hand, though ſome put two or three ſeeds in hillocks; they hoe it when it is come up, leaving each plant about a foot and a half aſunder, the drills three feet wide; they hoe up the ground to the plants two or three times; always when it is a foot high, again when it is two or three feet,

feet, and often a third time, as it nouriſhes the plants, and makes them ſtronger to bear the winds. The fine leaves round the fruit, they uſe in the beds; they lay on the ſtalks commonly for firing.

JOHN HOWARD, F. R. S.

They have a crop which they call Forty-days; and when any other ſeed-crop fails, they put in that ſort of Turkey wheat, as it generally gets ripe in about that time.

Abſtracts of Letters from Lieutenant R. HAY, of the Navy, to Mr. *James Speediman*, of the Strand, London, and by him imparted to the Society*.

ON SPRING WHEAT.

Eggie, October 9, 1775.

THE *Siberian* or *Spring Wheat* which you took the trouble to ſend me, has anſwered extremely well. I had a great crop from it: it was ſown the 6th of April, and reaped the 28th of Auguſt; never before was a crop of wheat produced in this Country, in ſo ſhort a time: it yielded from ſix to ſeven quarters an Acre; and the beſt

* The Thanks of the Society for Mr. *Hay*'s ſeveral communications were directed to be returned by Mr. *Speediman*.

of the grain weighed from fifty-eight to ſixty pounds per Buſhel. I am very certain that this grain may be of great ſervice to our Country and the North of England, as it ſeems perfectly ſuitable to the climate. If I was a man of fortune, I would undertake to make this wheat generally cultivated and uſed in Scotland.

On the Cluster Potatoe.

Eggie, November 4, 1775.

I have this time another favourite ſubject to write about to you, the great advantage ariſing from the cultivation of the *Bedfordſhire*, or *Cluſter*, otherwiſe alſo called the *Surinam Potatoe*. I grow them with remarkable ſucceſs, and raiſe immenſe crops; for I had above two hundred returns of them, this ſeaſon. Their anſwering ſo well with me, has made many gentlemen and farmers apply to have ſome for ſeed. They are of very great uſe in many reſpects; but particularly in winter, they ſerve the ſame purpoſe as corn to my horſes, and keep them better in fleſh, making them look cleaner and ſleeker, and do their work with more ſpirit, than when they were fed with corn. My horſes have had them conſtantly for three winters, and they are given without trouble, requiring no more than to be waſhed

waſhed clean, and laid in the manger, for they are greedily eat without being cut. And they alſo ſave hay, as with them and common ſtraw, the horſes keep plump and hearty. I can in other reſpects alſo aſſure you that they are a moſt uſeful and profitable root.

On Siberian Barley*.

Eggie, December 16, 1775.

I muſt ſtill, with your leave, add ſomething to what I formerly wrote about the *Siberian Barley*, which having tried in a variety of ſoils, both in the drill and broadcaſtway, I have found that the grain has always improved in quality. It has commonly weighed from ſixty-five to ſixty-eight pounds per buſhel, and renders a great deal of meal, of a very pleaſant and excellent quality. You may remember I told you, that I made bread of it; and now I have to tell you, that I once tried to malt ſome of it, and though I did not completely ſucceed, yet I muſt ſay, that the part which did malt, produced a moſt excellent high-flavoured ale. I have been informed that ſome gentlemen in Eaſt Lothian have tried it as a Winter

* The ſubject does not belong to this Article, but the circumſtances here related appear intereſting enough to be given ſubſequently to Mr. *Hay*'s former Report, inſerted in this volume, page 16 to 19.

Crop,

Crop, and have ſucceeded with it ſtill better than by ſowing it in ſpring. It is to be wiſhed that it may be brought into general cultivation: for, beſide its not ſhaking, it is not liable to blight.

On Tartarian Oats*.

Of the ſame date as above.

THE *Tartarian Oats* which you ſent me laſt, promiſe to be a grain that will be very valuable here. It was the firſt of April when I received them, a time too late by far for ſowing oats, nevertheleſs I ſowed them that day, in ground not properly prepared for them; notwithſtanding which, they came up well, yielded thirty returns, and have encreaſed in their weight. They are not liable to ſhake. The ground in which they were ſown, is ſtrong ſoil, a mixture of clay and loam. I ſhall ſow an acre or two in February next, with the improved ſeed I have now obtained, and occaſionally inform you of what farther may be worth notice. I am,

Dear Sir,

ever yours,

R. Hay.

* No mention having been made of that grain in the foregoing Papers, it may ſeem irregular to introduce it abruptly here; but uſeful hints generally being improvable, it will be granted, that this account of Mr. *Hay*'s trial ſo readily offering, could not properly be withheld.

SUP-

SUPPLEMENT

To the part of this XIth Article which regards the proſpect of advantage to ariſe from the Culture of the Indian Wheat, called Maize, *in England, confirmed in a Letter from Mr.* SHIELLS, *Nurſery-man at Lambeth, the publication of which was referred to ſome ſimilar opportunity.*

To the Editor of the Memoirs of Agriculture.

SIR,

SINCE the ſtudy of agriculture and gardening, as well as the practice of thoſe ſiſter arts, have met with the patronage of many of the moſt diſtinguiſhed characters of this nation, in a degree to enable us, as a people, to outſhine all our neighbouring kingdoms in the improvement of thoſe arts: and as your Work, Sir, is calculated for the purpoſe of rendering practicable, as far as poſſible, every hint collected from obſervation and experience; it becomes the duty of thoſe perſons, who make the diſcoveries, to communicate freely what they think may tend to the farther encreaſe of ſuch practical knowledge.

In a former Letter I hinted at the apparent utility the *Boerecole* might be of, as a winter and ſpring *pabulum* for cattle, particularly

ticularly for Sheep, and I cannot doubt of the ſucceſs of it with thoſe who have made the experiment.

At preſent I would beg leave to trouble you with a hint on the probable utility of the *Maize*, or Indian Wheat; a plant of excellent quality, the grain of which, when ground to flour, is whiter than that of our European wheat, and of a very hearty and pleaſant nouriſhment to the people where it is the common bread of the country.—It is alſo a moſt excellent food for pigs and poultry: and as an encouragement, to make experiments on this grain, I muſt add, it is a plant that requires very little trouble in its culture, and that it will grow and thrive on almoſt every kind of ſoil, particularly on light, ſandy, poor land, where our wheat will not ſucceed. I would therefore recommend the cultivation of this grain to thoſe gentlemen who have both inclination and ability to encourage ſuch experiments for the public weal, as well as their own advantage and amuſement; the culture of which being attended with as little expence as trouble, for it requires only the land to be well plowed and harrowed; after which, the ſeed may be ſown or planted in drills, at the diſtance of two or three feet, according as the land is of a rich or poor quality. It ſhould be ſown in March, and may be kept clean with the horſe-

horſe-hoe, if on a large ſcale; and if on a ſmall, with the hand-hoe. That is all it will require till harveſt, at which time the ears or heads of the corn ſhould be gathered by hand, and laid thin a few days, to become thoroughly dry before it be houſed for uſe.—If you think this hint worthy of a place in your Work, you are at liberty to make what uſe of it you pleaſe.

I remain,

Sir,

your moſt humble ſervant,

Lambeth Nurſery,
Dec. 12, 1768.

JAMES SHIELLS.

ARTICLE

ARTICLE XII.

Account of the Nature, and Culture of Boerecole, *and its Uſe in feeding Neat Cattle and Sheep: in a Letter from* AGRICOLA *to the Editor.*

SIR,

THE Society for the Encouragement of Arts, Manufactures, and Commerce, have offered the preſent year and the laſt, premiums for the cultivation of Boerecole for feeding Cattle, &c. I am very fully ſatisfied, as well as many others who have examined into this matter, both from the facts contained in Mr. *Wynne Baker*'s Report publiſhed in the *Muſeum Ruſticum*, for October and November, 1765, Vol. V. Number 52, and from other authorities and obſervations, that it is well worth the notice of the Society and the Public, and a very fit object of their Premiums; but the greateſt part, even of thoſe to whom an attention to it might be beneficial, are not in the leaſt acquainted either with the nature and uſe, or manner of cultivation of it: and therefore, however willing they might otherwiſe be to give it a fair trial, are wholly ignorant of the means.

To remove this obſtacle to the Society's ſucceſs in their attempt to introduce the culture of this plant in huſbandry; it is therefore requiſite the public ſhould have ſome clear information how to diſtinguiſh, obtain, and raiſe, this plant; and alſo how to apply it to the intended purpoſe: which information can be given only by a publication of it in ſome ſuch work as yours. As I was principally inſtrumental in leading the Society to adopt this ſubject, I thought it in ſome degree incumbent on me to take the taſk on myſelf: and accordingly in a letter treating of ſome other ſubjects in the *Muſeum Ruſticum*, I propoſed to give an account of this herb, and its uſes in agriculture, as I had before done of the turnep-cabbage, and ſome other ſimilar articles. But the unforeſeen, with reſpect to myſelf, diſcontinuance of that work, prevented its appearing there, and occaſioned the delay of its being produced to the public before this time. Your *Memoirs* have, however, now reſtored the much-wanted opportunity to myſelf and others to impart to the world any intelligence, as to matters of this kind, which we may imagine to be conducive to improvements in huſbandry; and I deſire therefore to make uſe of the channel of communication you have thus opened, on this occaſion.

The

The plant called *Boerecole** is, according to the language of botany, a *Braſſica*; or in plainer words, of the *Cabbage* tribe; but is of one of thoſe kinds which in the gardens are called *Cole*, or *Kale*, and which never form a compact knob, or head, as the proper Cabbage, but only a cloſe aſſemblage or body of looſe leaves embracing each other. It riſes to three or four feet high before the flower-ſtalk puſhes out above the leaves; but the flower-ſtalk extends it to the height ſometimes of five and ſix feet. The firſt leaves on the main ſtem are about one foot long, and narrow in proportion, and are very much curled and cut about the edges; having beſides, from their wavy texture, cavities reſembling cups, or what ſome of the earlier writers call *flaggons*. The number of theſe leaves cannot be determined, being more or leſs cloſe ſet, according to the ſize and vigour of the plant. The flower-ſtalk branches and bears ſmall yellow flowers, of the ſame form as thoſe of others of the cabbage kind: they are ſucceeded by ſmall long pods, containing from ſix to ten ſeeds, nearly of the ſize and colour of rape-ſeed.

* The knowledge of this plant, appears to come originally from Holland, where it has long been cultivated, and extenſively for culinary uſe. Its name is Dutch, and denotes a general utility to huſbandmen; *Beere-cool*, means Farmers-cale.

The

The appearance of the plant is ſingular and pleaſing, from its cut leaves and protuberances, whence it has been called *Braſſica fimbriata* by G. Bauhine, Tournefort, and others; and *Braſſica tophoſa*, by Tabernier and Gerard, who have figures of it. It has great merit, alſo, as an eſculent plant, and may be cut three or four times, which renders it valuable for that uſe, eſpecially as it may be always had in ſevere froſts*, that deſtroy moſt plants of the ſame nature.

There are two ſpecies of the Boerecole; the one purple, and the other green. They are not what botaniſts call ſeminal varieties, but real diſtinct ſpecies, preſerving their difference in ſeminal propagation. They differ principally in colour and hardineſs, but the purple is the coarſer of the two, and leſs fit for culinary uſe. The green kind is much the hardieſt, and will reſiſt the ſevereſt froſts: the rigour of which ſometimes deſtroys the purple. It is therefore that which will beſt anſwer the ends for which the Society mean to introduce the plant into agriculture: and indeed it is the green kind only which ſhould be raiſed with that view.

* Winter is the ſeaſon for Boerecole to be in perfection in Holland. Froſt makes the plant criſp, and diſpoſes it to be tender and delicate when dreſſed for the table.

The intention of the Premium offered by the Society for this plant, is to encourage the cultivation of it as a winter *Pabulum* for Cattle; to uſe an expreſſion brought into the Society by the late Mr. *Wych:* or in other words, a proviſion of winter or ſpring food for thoſe beaſts, in the ſame view as the large white or other Cabbages or Turneps. The qualities which this plant has, that fit it particularly for that purpoſe, are: *firſt*, its great hardineſs; whence it reſiſts the ſevereſt froſts without damage: in which property it has the advantage, not only over turneps, but of the large white and moſt others of the cabbage kind, which, except the Turnep Cabbage, and Cole-ſeed, are ſubject to ſuffer by intenſe cold or continued rains. *Next*, the great produce of herbage it affords, that according to Mr. *Wynne Baker*, is near twenty-four tuns per acre for the firſt crop, which is ſucceeded by a ſecond crop in a month or ſix weeks. *Laſtly*, its riſing high from the ground; which makes it practicable to crop it in caſe of exigence when the ground is covered with ſnow, and when turneps, turnep cabbage and other lower vegetables cannot be come at. Theſe qualities ſeem to render it a very valuable plant for the purpoſes of feeding Neat Cattle and Sheep: particularly its great hardineſs, that ſecures it from all acci-

accidents of weather. This dependence, which may be had on it in all contingences, is a point of extreme great conſequence in ſeaſons where hay and other fodder are ſcarce, and continued froſts make ſuch reſources neceſſary.

There are ſome, who, bigotted to their own practice, aſſert, that Turneps alone anſwer all the purpoſes for which this plant, the Cole-ſeed, and the Turnep Cabbage are recommended: but the anſwer to two queſtions, puts the matter out of doubt: that is, whether Turneps are not very uncertain on account of the deſtruction by the fly? and whether they are not alſo deſtroyed by the rigour of the weather in thoſe ſeaſons when they are moſt wanted? The affirmative muſt be granted: and then it moſt obviouſly follows, that any crop, which has a profitable produce, and is not in like manner precarious, muſt be very advantageous, when it is provided in aid of others that are uncertain, in caſes where a conſiderable ſtock is to be maintained, and there is an opportunity of adding ſome proportion of unperiſhable food, to that which may periſh in unlucky ſeaſons.

The manner of cultivating Boerecole for the uſe of feeding Cattle and Sheep, may be beſt practiſed in the following manner,

as far as experience has hitherto afforded the means of judging of it.

The ſeed ſhould be ſown in the month of March or April, on a bed, or pieces of clean land, in manner ſimilar to that of the Field or Scotch Cabbage. Care muſt be taken that the young plants be not ſuffered to ſtand too long, or too cloſe together on the ſeed-bed. The land on which they are intended to grow, is previouſly to be prepared by plowing, &c. as is practiſed for Turneps. It is eſſential to attend, that the time of the firſt rains, after the middle of May, is fitteſt for the purpoſe, and that the ſeaſon for planting out muſt not be later than Midſummer. It ſhould be done in rows, at the diſtance of about two feet and a half, row from row; and from twenty inches to two feet, plant from plant in the rows. If the ſeaſon proves very hot and dry after planting, and it can be conveniently done, one good watering would be of ſingular uſe to the plants: after which, nothing more is required, than keeping them regularly hoed, either with the hand, or horſe-hoe.

If the circumſtancial detail, I have entered into, merits ſo much approbation, as to obtain for this Letter a place in your Memoirs of Agriculture, I hope, it will induce

duce ſome of your Gentlemen Farmers, to give this valuable plant a trial at large.—They are now ſufficiently informed of the nature and uſe, as well as the manner of cultivation of it; and may eaſily convince themſelves from experiment, and the public from the report of their ſucceſs in the attempt, of its real and extenſive utility.

I remain,

Dear Sir,

Your friend and humble ſervant,

December 26th, 1775.

AGRICOLA.

Method of Manuring Land by means of putrified Rain-water, imparted by RODOLPH VALLTRAVERS, Eſq. a Member of the Society, in a Letter directed to the Secretary*.

Mortlake, Surry, April 19th, 1770.

SIR,

Mr. *Clayſs*, an ingenious young artiſt, juſt arrived from Zurik, in Swiſſerland, has brought me the following account of a new method of manuring meadow lands; and equally applicable to ground laid out for other vegetables; which on account of apparent utility I take leave to impart to our Society. It conſiſts ſolely in fermented Rain-water, collected and uſed as follows.

1ſt. Place a trough, tub, or other veſſel of wood, or ſtone, of a ſize proportioned to the extent of ground, and ſunk into the earth, at the loweſt part of the field.

2d. Its upper edge being made even with the loweſt part of the field, muſt be covered with boards or ſticks, over which is to come a layer of ſod or turf, to prevent all exhalation of the fine nitrous particles raiſed by the wind, or ſun; leaving an opening on one ſide, for the ingreſs of the

* The Society ordered thanks to be returned to Mr. *Valltravers* for this communication.

rain-water, and for raiſing it out with a hand-pump, when wanted.

3d. The rain-water muſt be left ſo long in the veſſel or baſon, till it has fermented and is grown putrid; and then is to be diſtributed in artificial ſhowers ſucceſſively over different parts of the field; one part one day, another on a ſubſequent day, or oftener where moſt wanted.

4th. The ſediment is to remain in the bottom of the veſſel, that by its acrimony it may bring the new acquired rain-water into an immediate ferment.

5th. Care muſt be taken, never to uſe the artificial ſhowers in hot ſultry weather, when they would do more harm than good, by the diſagreeable ſenſation, with which the plants would be ſtruck, and the ſuppoſed effect of the nutritious ſap ſinking down into the roots. The beſt time for watering is after ſun-ſet, when the vegetables are recovering from their languor, and the fermented rain-water is diluted by the dew, before it be abſorbed by the plants.

6th. One man, with a ſmall pump-engine, and a watering-pot, will raiſe and diſtribute an hundred gallons or more of this fertiliſing liquor in a ſhort ſpace of time, and beſprinkle three or four acres.

The experiment has been tried on fifteen acres of land, ſo barren as not to feed one head of cattle; and after three years impregnation with putrid rain-water, it yielded gradually up to ſeven loads of hay. The benefit is ſoon felt; and the ſecond year repays the expence an hundred fold.

It appears to me that this diſcovery will become generally uſeful by being brought to the knowledge of the Society, and recommending the care of that to you, I remain,

Sir,

Your obedient humble ſervant,

RODOLPH VALLTRAVERS.

TWO

TWO RECIPES

For the making of Ointments to cure the Scab in Sheep, and to kill Ticks and other Vermin lodging in their Wool:—communicated to the Editor, by a Gentleman of Peebles, a Sheep County, in Scotland, where the Remedies have been applied with much ſucceſs.

For the Scab.

TAKE of tallow, two pounds; of ſoft or black ſoap, half a pound; mix them together over a ſlow fire, and add by degrees, of train-oil, five pints; and of oil of turpentine, one pint: when theſe are ſufficiently combined, then ſtir in carefully, of mercurial ointment, four ounces; and the compound will be fit for uſe.

The above quantity is required to ſalve twenty-four ſheep, putting the ointment into layers or ſhades opened in the wool, and made in number from three to ſeven, according to the condition of the ſheep: the whole to be thus unequally divided among them.

For Vermin.

Take of tallow, two pounds; of train-oil, four pints; and of oil of vitriol, ſix ounces.

ounces. Combine theſe ingredients in the manner above directed; and uſe the ointment in the ſame way.

The Gentleman obſerves, that the ſcab and vermin proceed from poverty and negligence; and that ſheep either fat or in fleſh, are not ſubject to thoſe diſorders; and likewiſe, that the beſt preventive and aid in the cure of the diſeaſe, is to give the ſheep plenty of nouriſhing food.

ARTICLE

ARTICLE XIII.

Account and Deſcription of a Machine for dividing Spaces, and rendering the practice of Planting and Setting more expeditious and exact than by any Method hitherto uſed; invented by Mr. ARTHUR REID.—*Deſcription of a new Drill-plough for ſetting Wheat or other Grains and Seeds upon flag or tempered Land, invented by Mr.* JAMES BLANCHER.—*Account and Deſcription of a Machine or Bellows for fumigating and deſtroying Inſects on Cucumbers, Melons, and Fruit-trees, by Mr.* THOMAS GREEN: *communicated to the* Society for the Encouragement of Arts, Manufactures, and Commerce; *and inſerted at their Requeſt.*

Memorial preſented to the Society for the Encouragement of Arts, &c. by Mr. ARTHUR REID, communicating the invention of a Machine intended to facilitate the practice of planting and ſetting Vegetables*.

MY LORDS AND GENTLEMEN,

THE model herewith preſented to the Society, is the reſemblance of a ſimple machine, deſigned to render the practice of planting

* This Memorial and the Model ſent with it, were referred by the Society to the Committee of Agriculture; where

planting far more expeditious and exact than any method hitherto uſed.

It conſiſts of a plain cylindrical braſs roller, on which are fitted moveable rings or hoops with pegs of a conical form, fixed into theſe rings at equal diſtances: If a roller, ſimilar to this model and executed at large, is drawn upon the ſurface of plowed or garden ground, properly prepared; it will trace out with preciſion, the furrows and holes uſually marked on the ground when planting or ſetting at meaſured diſtances aſunder is practiſed.

And whereas it will be often found neceſſary to have the rows nearer or more remote, according to the nature of the tree, plant, &c. theſe hoops may be tranſpoſed by hand, to any diſtance; and conſequently the ſpaces between the plants may be enlarged or diminiſhed at pleaſure. Theſe

* where being examined, the invention conſidered as ingenious, and the practiſe likely to prove uſeful; it was reſolved, that a machine at large ſhould be made, for deciſive trials. Money was advanced to Mr. *Reid* for its conſtruction; but he getting into debt and misfortunes, the machine was never produced, and the intention was defeated: nevertheleſs, having met with ſo much approbation, the contrivance muſt have had merit; and it is here imparted as an uſeful hint, improvable from the deſcription in the Memorial, with the additional advantage of its offering a machine of an inconſiderable price, as the inventor particularly aſſured the Committee, even for that which was to be of town make.

hoops

hoops alſo, together with the pegs, may be urged round either backward or forward, ſo that the pegs of one circle may point in the middle between two of the next, and ſo on; which gardeners may probably do, in order to promote the growth of vegetables with the leaſt ſuperfluous room: and whereas it is proper that regard be had to the remoteneſs or vicinity of the pegs, in a tranſverſe order, the rings or hoops are to have holes peirced all round, ſimilar to the drilled holes in one of the rings of this model; ſo that each peg may be removed any number of holes aſunder, and a pin driven through each, to keep it firm.

If any earth, by reaſon of its humid or adheſive quality, ſhould happen to ſtick to the barrel, the thin piece of braſs with notches, extending the whole length of the barrel, will clean it at one revolution.

When it is drawn from end to end of a piece of ground, thoſe who want to have the ſpaces worked out mathematically exact, will require that the machine in its return ſhould deſcribe the row of ſpaces next to the former exactly parallel, which a perſon directing the machine at random can hardly effect; but this objection is obviated by means of the ſmall pullies which ſlide ſtiffly on an elaſtick braſs wire ſoldered to the fore-part; for if the perſon, who ſtands within

within the frame, direct his eye to either ſide upon the preceding groove or furrow, and guide the machine ſo as the pully collineates with the former groove, without falling in contact; the rows which he is then deſcribing, will be exactly parallel: all which is eaſier done than deſcribed.

The braſs wire whereon the pullies ſlide, is made elaſtic, leſt the man who draws, by any accidental inclination of the body or ſudden irregular jerk, might urge the pullies into the ground, ſo as to dig or obliterate the preceding furrow.

This machine, executed at large, may be drawn by a man in gardens, and in the fields by one or two horſes, according to its magnitude, which may be from two to four feet diameter, and the length of the cylinder from three or four feet in length to ſix; for it is not neceſſary, as in other machines, that its magnitude ſhould be reſtricted to any particular dimenſions.

If the model is tried on moiſt ſand, or fullers earth, its effect will be more conſpicuous, and I hope ſatisfactory.

This invention may tend to facilitate the practice of planting in general; but ſeems more particularly adapted for nurſeries, and for cabbages, coleworts, and thoſe herbs that are tranſplanted; alſo for ſainfoin, peas, beans, and various other articles diſpoſed

diſpoſed in rows or drills; which to perſons converſant in gardening need not be enumerated.

Rollers may be uſed with or without hoops or pegs fixed; but then every roller will ſerve for one particular ſpecies of plants only.

Theſe rollers, according to an eſtimate I have made, will do the work of eight or ten men, with only one; and may be executed at large, with common materials, for two or three guineas: but if the hoops and pegs are moveable, then from three to five.

Strand, May 26th, 1768.

ARTHUR REID.

P. S. The conical form of the pegs, is a peculiar circumſtance to be attended to in the execution, becauſe if they were long and too little tapered, they would raiſe the earth while the cylinder revolves. The rationale of the form is ſomewhat curious, and wholly geometrical; for if the cylinder or roller was to remain in the ſame ſituation in which it revolves on the axle, the pegs would raiſe the ground, unleſs the radius of the baſe of the foreſide of each peg, was equal in length to the ſine of the arch deſcribed, before it leaves contact with the

the ſurface of the ground; but as the barrel communicates to the peg a twofold motion, viz. a perpendicular elevation, and horizontal progreſſive motion, it gradually recedes from the hole while it is raiſed; but as a demonſtration would be tedious and unneceſſary, let it ſuffice to obſerve that the peg in all dimenſions, muſt have its baſe in a geometrical proportion to its altitude; and by experiment, the conical point of each peg, will be found to be ſubtended by an angle of thirty degrees.

Deſcription

Letter to Mr. Secretary *More*, from a Friend (of the Inventor) in Eſſex, ſubſequent to a verbal inquiry about the mode of communicating the Invention of a Drill-plough, and offering it to the Society in claim of an adverti ſed Premium, for an improved Machine of that kind.

Friend *More*,

AN ingenious friend of mine in Norfolk, having lately invented a machine for ſetting wheat, which promiſes to anſwer the purpoſe better than any I have yet ſeen, is deſirous of having it come under the inſpection of your Society. I have therefore written an account of it to my friend, James Beaſly, requeſting his aſſiſtance to introduce it to them.—He informs me, that he has communicated the hint I gave him, to thee, and ſome of the gentlemen concerned; and recommends only writing thee a deſcription of the machine, that, if it be deemed worthy of any farther notice, a time may be fixed for the projector to bring it to town, and lay it before a Committee of the Society. I am but a bad hand at deſcription, but have below attempted to give ſome idea of it; the deficiency however muſt be placed to my account, rather than to that of the machine itſelf, as I deſcribe it only

from memory. The perſon who invented it will be glad to wait on thee with it at any time appointed; but as I ſhall have occaſion to come to town in about three weeks, he would like to meet me with it at that time, if agreeable to thee.

Pleaſe to give me a line as ſoon as is convenient, informing me what day will be moſt ſuitable for him to wait on thee, and the place where.

I am, very reſpectfully,
Thy obliged Friend,

Great Bardfield, Eſſex,
Nov. 25th, 1774. EDMUND RACK.

Deſcription of a new Machine for ſetting Wheat.

THIS Machine is ſomewhat in the form of a child's waggon, and is about three feet long and two feet high:—in the fore-part are two iron ſhares, about four inches diſtance, which plough two parallel furrows, about two inches deep:—the ſhares are followed by two ſmall wheels, two inches thick, but ſharp at the bottom, which keep the furrows open for the wheat, by preſſing the looſe earth ſmooth on the ſides.—In the body of the machine is a cavity, into which the wheat falls from a hopper;—and when the

the machine is moved, a barrel caſt in braſs, admits ſingle grains of wheat into the holes made round it, and drops them through an aperture at the bottom, into each furrow, at about three inches diſtance from each other. This barrel is on the axle-tree of the machine, at the extremity of which are two wheels, about eighteen inches diameter, on which the machine rolls. The holes in the barrels are ſo formed, that only one grain of wheat can go into each, unleſs they are remarkably ſmall, and in that caſe only two can enter a hole; and by means of ſome ſmall ſprings, the grain cannot miſs dropping when it comes to the bottom.—The number of grains it drops in a yard, is about twenty-four in each furrow; which ſome of the beſt Norfolk farmers tell me is as many as they ſet by hand. Behind the machine is a trail, placed to cover the grain. When it goes it is drawn by an iron handle, in the manner of a garden roller; and with one of theſe machines, a man may ſet an acre in a day, which is the work of twelve perſons to ſet by hand; and more than a peck of the ſeed is ſaved, which by the careleſſneſs of the droppers, is uſually loſt.—The whole machine is portable, and may very eaſily be carried into the field; the advantages attending its uſe, are ſo many and great, that I think it cannot fail, on trial, of gaining your approbation.

EDMUND RACK.

Letter from the Inventor, in conſequence of an Anſwer to Mr. *Rack*, written by the Secretary, thanking him for the Communication, and informing him, that the Plough may be ſent in, with ſuch Deſcription of it and its Uſe, as may be proper for explanation; from which, and particularly the ſimpleneſs of Conſtruction, the Society often judge of the Merits; without putting the Inventor to the trouble of Attendance: promiſing alſo to pay the Expence of Carriage, &c.

Attleborough, Norfolk, 17th of 2d month, 1775.

Friend *More*,

ACCORDING to thy requeſt, have ſent thee the method of uſing the Drill-plough, or Machine, to ſet Wheat, &c. but am not able to make a proper addreſs to ſo learned a body as the Society of Arts, &c. knowing my own inabilities of learning; therefore hope the utility of the machine will prove a ſufficient excuſe.

I am thine reſpectfully,

JAMES BLANCHER.

Method

Method of ſetting Wheat and other Corn, and Seeds, on flag or prepared Land, with the new invented Drill-plough; reſpectfully preſented and addreſſed to the Society, &c. &c. by the Inventor *James Blancher*.

LET a quantity of clean dry wheat, or wheat well cleaned and dried after ſteeping, be put in the box or body of the machine, ſufficient to cover the riddle or grate at the bottom: then fix the coulter, ſo as to cut a furrow one inch or rather more deep in the ſoil; the coulter is followed by a ſmall iron wheel, which opens the groove or drill: this wheel may be made faſt by a ſmall iron pin through a hole therein to fix it; by that means it will cut deeper if required. Then apply the hooks of the iron-rod handle, to two ſtaples in the fore-part near the axis of the iron wheel. Let the perſon that uſes it, walk backward drawing the machine after him, upon land once plowed and rolled even, as is uſual for ſetting wheat by hand and dibble: as the machine goes along, it will make a groove or drill, dropping the wheat regularly at the rate of ſix or ſeven grains in a foot; but if that ſhould be thought too thick, it may be remedied as follows: at the bottom

of the machine is a ſmall leather belt or ſtrap, with a buckle, ſurrounding a ſmall barrel on the axis of the large wheel, communicating with a barrel of three different diameters, on any of which the ſtrap or belt may be fixt at diſcretion: when the ſtrap is placed on the largeſt part, the grains drop at the greateſt diſtance from each other; and vice verſa: by this means it may be dropped as thick or thin as the farmer pleaſes; but experience has proved ſix grains to a foot the moſt proper quantity. To prevent the girdle from ſlipping, chalk it. If the machine does not click, it does not perform. The ſtrap muſt therefore be drawn tight, till it carries the barrel round, which is alternately filling and delivering the grain, and will ſet equally well, either wheat, rye, or barley. At the hinder-part of the machine a trail follows to cover the grain, which may be loaded at diſcretion. The machine ſhould be drawn a ſteady pace; about two-thirds as faſt as a plough is commonly driven; at which rate, it will ſet an acre in a day, being as much as twelve perſons, that is to ſay, three men with dibbles and all their followers, can do in the ſame time, and it is performed with much greater regularity; but it muſt not be drawn too faſt, for if the *projectile force* be *greater* than the *gravitating power*, the grain will ſometimes be

be carried round with the motion, and drop unequally. Hence due attention muſt be paid to the mode of uſing it; and if this be done, there is no doubt but it will fully anſwer expectation, and be uſeful to the public, in proportion as it is adopted.

Theſe machines may, on this principle, be made to drill two, three, or four rows at once. Thoſe of two rows may eaſily be drawn by hand on turf-land: thoſe of three or four rows may be drawn by a horſe, and are beſt adapted for tempered land; the turf-land not being level enough for more than two rows, which ſhould be both on one flag, and about ſeven or eight inches aſunder. Much may be ſaved in the expence of making theſe machines, by the following variation from this ſent to the Society: 1ſt. The Barrel, which is the moſt difficult and expenſive part, may be made of caſt iron, neatly finiſhed: the Iron Wheel may alſo be caſt with an axle-tree of its own. 2d. The Axle-tree or main Spindle, may be turned of wood, with the naves or hobs of the ſame piece, and wood rims; as thoſe of a common plough, which will carry the machine for many years. 3d. The Lock, or Braſs Plate, whereon are two bolts with ſloping ends, to admit of the grain paſſing through, without being cut, may, by ſending a patern, be made at Birmingham, much cheaper

than in any other place. The materials being collected from the beſt market, and put into the hands of a common wheelwright, may be eaſily finiſhed, almoſt in any country place; and the cheapneſs will render it more ſerviceable, eſpecially to ſmall occupiers. In all agricultural improvements, to increaſe the quantity, and improve the quality of grain, are the two grand objects: the mode of ſetting wheat, were it generally practiſed, would do the firſt, by ſaving three-fourths of the quantity annually uſed in ſowing: and ſuperior crops ſo raiſed would effect the ſecond. This the Norfolk farmers univerſally admit, and their next object in view, has been to reduce the expence of ſetting by hand, which is about nine ſhillings an acre. This machine effectually anſwers that end, by waſting leſs grain, performing the work with greater regularity, and reducing the coſt from nine to two ſhillings per acre.

Upon a careful calculation, I find two pecks and a quarter of wheat, will ſet an acre of land, at ſeven corns to a foot longitudinally, the rows being eight inches aſunder; the ſame quantity will alſo be ſufficient to ſet an acre with two rows on the ſame flag, four to the foot, and the rows four inches aſunder: about half a peck more of barley than wheat, is wanted for an acre,

on

on account of the grains being larger; rye nearly the ſame as wheat. Barley has been lately ſet with great ſucceſs.

Attleborough, 31ſt of the third month (March) 1775.

Friend *More*,

I received a letter from my friend *Rack*, dated 27th inſtant, informing me, that the Machine does not meet with the approbation of the Chairman of the Society, on account of its not performing as well upon rough cloddy land, as upon prepared land fit to dibble upon; which depends altogether upon the ſize of the machine, and not its conſtruction, as there is nothing large or ſmall, only comparatively—ſo this may by ſome be conſidered only as a model, and there may, from its conſtruction, be made one large enough to perform after the roughеſt and moſt unfiniſhed ploughing; it may be proportioned to any medium that ſhall be required. I did not expect that the Society would require the preſent machine to perform the office of a rough harrow and a pair of horſes, as all land ſhould have a previous preparation before it is fit either to ſet or ſow. The preſent mode of ſetting wheat, &c. by dibbling, is to ſet it upon

upon land once turned over by the plough, after graſs or clover, ſtubble, &c. firſt being rolled and buſh-harrowed, on which the machine in its preſent ſtate will certainly perform, more accurately than ſetting by hand: it finiſhes as it goes, and will make a conſiderable ſaving in the grain, by the ſingularity of its dropping; and will perform better upon heavy land than upon light ſoil, as I have experienced, and make no doubt, but would give Eſq. Young full ſatisfaction of its performance, if I was with him at the time of uſing it; but as I have been at much expence already in my firſt attempts, inventing, making the machine, &c. I cannot undertake to attend, without the Society will bear my expences. I would not have offered to ſo reſpectable a body as the Society, any paltry invention, or any thing I could not juſtify or make perform upon any common ſoil, after a previous reaſonable preparation: and on the other hand, I do confidently expect, that the Society will not paſs a raſh ſentence upon it, but rather attentively enquire into the merits of the plough, to determine comparatively, upon the words of their own Advertiſement, which ſet me to work, with a view of ſerving them, myſelf, and the whole community: they run thus:

"For the beſt Drill Plough for dif-
"ferent ſeeds, being an improvement on
"thoſe already in the poſſeſſion of the So-
"ciety, or generally known: to be pro-
"duced to the Society on or before the firſt
"Tueſday in March, 1775, &c."

How far the utility of the machine may correſpond or co-operate with the above Advertiſement, muſt be left to the ſuperior judgment of the Society; which I hope will be taken as a plain indication, that I do not mean to judge for myſelf, or to uſurp their authority from the clauſe wherein they reſerve a diſcretionary power of judging for themſelves, which I make no doubt will be impartial and candid.

On the other hand, I deſire no reward, without ſome merit; nor no fame, but an honeſt one: and conclude with dutiful reſpect to the whole Society,

JAMES BLANCHER.

P. S. I ſhould like to have an anſwer as ſoon as convenient.

It was obſerved, that the machine could not be thought to ſuit all the farmers in the nation; but as it will ſuit the greateſt part, I hope it will be thought to have its good properties. The farmers from all the adjacent towns round me, have called upon me to ſee the original machine I have by me;

me; though it is not ſo complete as that delivered to the Society, yet all on ſeeing it tried upon different ſoils, are well pleaſed with it, and ſay, it performs the office to their full ſatisfaction: there has not been one diſſenting voice. I have many private orders, but ſhall ſuſpend obeying them until the determination of the Society*.

* The Society having examined the Drill-Plough, and trials being made with it, by their direction; they reſolved, it was their opinion, "That this Drill delivered "the Seed in a more regular manner, than any Plough "in their poſſeſſion:" and Certificates being produced, to prove who the Inventor truly was: They reſolved in conſequence, "That Mr. *James Blancher*, Watchmaker "at Attleborough, was entitled to the Premium of a "Gold Medal, or Thirty Pounds, offered by the Adver-"tiſement." And the Inventor, on his part, choſe the pecuniary Reward, in amends for the money he had expended in making models, and the machine ſent to the Society.

Account

Account of a Machine or Bellows for fumigating and deſtroying Inſects on Melons, Cucumbers, and Fruit-trees; invented by Mr. THOMAS GREEN, Flower-gardener to Her Majeſty at Kew, produced in claim of the Premiums offered by the Society, and communicated by the following Letters.

To Mr. Secretary *More*.

Oct. 13, 1771.

SIR,

THE great damage moſt ſorts of trees and plants frequently receive from inſects, has made it my particular ſtudy to endeavour to find out an eaſy and expeditious method of deſtroying them. I think I have now the pleaſure of preſenting to you, for the approbation of the Society, a ſimple machine of a pair of fumigating Bellows, which at a little expence, and in a very expeditious manner, and from various experiments, ſeems to anſwer the end propoſed by the Society, in their two Premiums for deſtroying the *Red Spider on Melons*, and the *Black Fly on Cucumbers*.

The large part of the pipe is filled with tobacco, and when lighted, is fixed on to the bellows: you then, by working them, can

can throw any quantity of ſmoke you pleaſe into the frames where you have melons and cucumbers infected with the inſects; and by putting the glaſſes cloſe down, in a very little time every inſect is deſtroyed, and the plants do not receive any injury from the ſmoke, during the ſmall time that it is neceſſary to ſhut them up in it, and which is of about half an hour; or as much more upon repeating it, if attacked again.

It has been tried alſo with equal ſucceſs, on fruit-trees againſt walls; but has been found more particularly uſeful in deſtroying the various ſorts of inſects which are known ſo much to infect almoſt every ſpecies of plants in ſtoves; and where a hot-houſe has almoſt all the plants covered with inſects, it is then neceſſary to fill the houſe full of ſmoke, which is done in a quarter or half an hour, according to the ſize of the houſe; it is firſt directed to thoſe plants which are moſt infected; and when the ſmoke is too violent for the gardener to remain in it, it is eaſily conveyed through a ſmall hole, to entirely fill the houſe.

I have ſent the original pipe which was firſt made, and three others of different conſtructions; but I ſhould be doing an injury to a very ingenious and induſtrious man, if I omitted to inform you, that the original invention is due to Mr. *Green*, flower-gardener

gardener to her Majeſty, at Kew; I have only had theſe others made for the inſpection of the Society, as Mr. Green from his employment, had no time to ſpare about them; the ſyringe will be found particularly uſeful in cleaning any plant with water, by waſhing off the dead inſects, and the duſt afterwards: it anſwers the beſt of any method I ever ſaw.

I alſo beg leave to inform the Society, that it is Mr. *Edward Derly*, Air-pump-maker, in Union Court, Holbourn, who made theſe machines, and requeſts the favour of making them, for any gentleman who will pleaſe to purchaſe them for uſe.

R. W.

P. S. I ſhould preſume to think this machine may be applied with ſucceſs in deſtroying Ants and Waſps-neſts; and alſo, if not ſuffocating Moles, at leaſt in driving them out of their holes; particularly in a garden where there are only a few, and then they are ſoon routed: but theſe experiments I have not yet had an opportunity of trying.

Kew

Kew Garden, 4th November, 1771.

SIR,

IN order to demonſtrate the Utility of the Fumigating Machine for deſtroying Inſects, invented by *Thomas Green*, Foreman in their Majeſties Flower-garden, at Kew: I preſume to lay before you the following Experiments made in her Royal Highneſs the Princeſs of Wales's Garden, at Kew.

And firſt on Cherry-trees in a hot-houſe, and on cherry-trees in an open expoſure; but more particularly in a hot-houſe, where they are for the general part infected with a great number of ſmall black inſects, which make their appearance by the time the trees are in bloom, to the great prejudice both of leaves and fruit. I have been at ſome trouble during my practice to diſcover ſome method of deſtroying thoſe hurtful inſects, and have found nothing effectual but the fumigating machine, which intirely eradicates all the kinds which I have known to infect the trees, at once uſing; and if repeated once in about ten days, it will keep them clean the whole ſeaſon, without detriment to leaves or fruit.

2d. On Peach-trees. Peach-trees when forced in hot-houſes, have great numbers of inſects which appear on the underſide of the

the leaf; they are a kind of ſpider, of a red colour: there is alſo a brown inſect which for the general part is found on the end of the young ſhoots, accompanied with great numbers of ants, which, if neglected, entirely deſtroy the young wood for the ſucceeding year. I have found tobacco-duſt in ſome meaſure to anſwer the purpoſe for the brown inſect; but not equal to the fumigating machine, which deſtroys all the kinds with application, as in the article of Cherries.

3d On Melons. I planted thirty lights of melons this ſeaſon, on or about the 11th of June, which continued in great health and vigour about ſix weeks; when obſerving them not to grow ſo faſt as might be expected, on examination, I found the leaves on the underſide covered with a web and a multitude of ſmall ſpiders, which, when the ſun was hot, cauſed the leaves to turn up their edges. I immediately applied the fumigating machine, ſhut the lights up cloſe, and covered the bed with mats three double; and in the courſe of twelve hours applied it four times: but notwithſtanding, I found ſome inſects alive on the plants the next day, I am of opinion it deſtroyed them ſufficiently, as the melons continued their growth, and carried on a good crop of fruit to the end of the ſeaſon.

This machine was thought of by Mr. *Green*, in the year 1769, for deſtroying the green inſects on roſes, in which he found it effectual; and I being a near neighbour, have had the opportunity of extending it to the above ſeveral experiments.

I am, Sir,

Your humble ſervant,

JAMES STAPLES.

All which is farther confirmed by the following Certificates; as likewiſe by this Declaration on the back part of the letter.

I am convinced of the Truth of thoſe Experiments made in the Royal Gardens.

JOHN HAVERFIELD.

November 2d, 1771.
From His Majeſty's Garden at Richmond.

THIS Certifies, that the Machine invented by Mr. *Green*, for deſtroying of Inſects on Plants, is, in my opinion, and according to what uſe I have made of it, certainly an effectual deſtruction of inſects in general. I have tried it on Peach-trees, Cherry, and Roſe-trees, and it always had its deſired effect: and by my moſt minute obſervation, with being properly applied, will entirely deſtroy the Inſects on Melons, Cucumbers,

cumbers, and all other plants, that require or are deſerving of its application.

Dated as above. JAMES STAPLES *ſenior*,
Foreman of the ſaid Gardens.

THE Fumigating Bellows, invented by Mr. *Green*, Flower-gardener to the Queen, which have been by experience found to be of the greateſt uſe of any thing yet tried for killing all ſorts of Inſects, &c. either in Hot-houſe, Cherry, Melon, or Peach-houſes, without damage to either bloom or leaf; is recommended by

your humble ſervant,
RICHARD WELLS.
Foreman of the Melon Ground
at Richmond Lodge.

Mr. *Green*'s Method of fumigating the Melon-frames.

THE frames ſhould be fumigated ſoon after the plants are ſet out, whether there is any ſuſpicion of the inſect, or not, as it will not in the leaſt injure the plants; and it is better to prevent their doing miſchief, than wait till the plants have received a check. This ſhould be done once a fortnight, or otherwiſe at diſcretion; and continued till the fruit is large: the fumigating, if required once in a day, ſhould

be performed immediately before covering up the lights.

If the lights are leaded, the ſmoke will have the greateſt effect: but if they are lap-lights, the ſmoke will get out through the crevices; therefore paper-lights ſhould be put on, inſtead of the lap-lights, while the frames are fumigating.

GENTLEMEN,

THIS is to certify, that the Fumigating Bellows, invented by Mr. *Green*, Flower-gardener to the Queen, when properly applied, will deſtroy all ſorts of Inſects in the Hot-houſes, Peach-houſes, Cherry-houſes: from what obſervations I have ſeen and proved, it is a great help to Peaches and Nectarines againſt the walls.

I am your humble ſervant,

Richmond, Surry,
November 3d, 1771*. HENRY HAWES.

* Theſe Letters and Certificates, with the Fumigating Machine, being laid before the Society, and the Subject taken into Conſideration; it was reſolved, that the Inventor, Mr. *Thomas Green*, was entitled to Twenty Pounds, being the Premium offered for deſtroying the Red Spider which injures Melons.

ARTICLE

ARTICLE XIV.

Account of a new Eſtabliſhment in England for the Manufacture of Chip Hats, from a particular ſort of Willow, cultivated for that purpoſe, by Mr. PEPPERELL *of* Totnes, in Devon.—*Letter upon the profitable Application of an improved Method of refining Pig or Caſt Iron, and making Bar Iron for Guns, Anchors, &c. as likewiſe for producing that clean and white Iron wanted for ſmall Work and Toys, diſcovered by Mr.* JOHN BEDFORD.—*A Method of preventing the hurtful Effects of the Fumes of Mercury riſing in the Operation of Water-gilding on Metals, propoſed by Mr.* J. HILLS, *of Roſomon Row, Clerkenwell.—Account of ſome Methods of cleaning Ivory, with Attempts of reſtoring diſcoloured Ivory to an agreeable white State, and taking out accidental Stains, by Mrs.* JOHANNA KRULLE. —*Severally imparted to the* Society for the Encouragement of Arts, *and inſerted at their Deſire.*

MEMORIAL to the Society for the Encouragement of Arts, Manufactures, &c. on the Manufacture of Chip Hats in England, as a valuable Article in Trade, to ſupply what has hitherto been imported from abroad.

To the Society for the Encouragement of Arts, Manufactures, &c.

MY LORDS AND GENTLEMEN.

AS your deſign is truly laudable and uſeful, your Memorialiſt humbly preſumes to lay before you, a ſample of Chip Hats made by him, together with a ſample of the wood, of which they are made; which wood is in its native purity, free from ſcouring, bleaching, or whitening.—That a work of this kind has been long wanted in this kingdom, admits of no doubt, as numbers of the poorer ſort of people, who are now in great diſtreſs for want of work, may by means thereof be kept employed. But though it has ſeveral times been attempted, it has never been attended with ſucceſs, owing to the want of wood proper for the undertaking.

For ſeveral years laſt paſt, your Memorialiſt has made it his daily ſtudy to bring this valuable branch of trade into this kingdom,

and

and to remove that great obſtacle againſt it, by planting wood proper for the work. After many experiments made in planting wood of different kinds, he has at laſt, he believes, happily ſucceeded; ſeveral acres of that which he has now growing, will, he makes no doubt, upon examination, be found equal, if not ſuperior to the foreign wood.

Wherefore your Memorialiſt humbly hopes, that his endeavours will meet with a favourable reception; and that you will reward him according to his merit, is the prayer of,

My Lords and Gentlemen,

your moſt obedient, humble ſervant,

Totneſs, 15th October, 1773.

JOHN PEPPERELL.

This Memorial having brought on an inquiry into the Subject at large; ſome leading Queſtions propoſed, were ordered to be imparted to Mr. *Pepperell*, who then wrote the following Letter in anſwer, to the Secretary.

SIR,

I received yours, wherein you deſire to be informed of the Prices of the different ſorts of Hats; they are as follows:

The fine wove Hats at . . .	£.	1	4	0 per dozen.
Second ditto at		0	10	0
Courſe ditto at		0	6	0
Chain wove ditto		0	15	0
Twiſt ditto for the uſe of Covering		0	6	6

Theſe are the prices that I ſell for at preſent, but if required, I could render them much lower. The hats for covering will make two ſhillings per dozen more than the foreign, on account of the wood, which is of a much ſtronger nature.

I have no objections againſt letting the Society know, what kind of wood it is that the hats are made of; and whatever kind of encouragement they chuſe to give, will be moſt thankfully accepted by

Their, and your, moſt obedient
humble ſervant,

Totneſs, 1ſt Nov. 1773.

JOHN PEPPERELL.

The Society ſtill proceeding at large, took the opinion of perſons converſant in that article, and finding "that a Fabrick "of Chip Hats, made of Chips being the "produce

" produce of this Country, was an object " deſerving the Encouragement of the So- " ciety:" The Secretary, as cuſtomary, was ordered to procure confirmatory Information of the facts laid before them: and the Mayor of Totnes being applied to, the following anſwer was obtained from him.

Totneſs, 21ſt Jan. 1774.

SIR,

YOUR letter deſiring anſwers to a few queries, relative to a manufacture of Chip Hats, in imitation of Leghorn hats, carried on by Mr. *John Pepperell* of this town, I received on Tueſday laſt, and I have the pleaſure of being able to return ſuch anſwers as, I hope, the Society will think ſatisfactory. In reply to your firſt query, whether Mr. *Pepperell* has made hats of wood of his own planting? I can ſafely anſwer in the affirmative.—You then deſire to be informed, whether he has planted ſeveral acres of wood for that purpoſe?—He has planted many acres of wood, but as he uſes part of it in another manufacture, it cannot be ſuppoſed that he planted it for the ſole purpoſe of making hats:—he has however, ſince his invention of making hats, conſiderably increaſed his plantation. He has made many groſſes of hats, and I

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can ſee no objection to his continuing the manufacture, and increaſing it; though not immediately to a great extent, as it neceſſarily will require ſome time to inſtruct people for that purpoſe—Should it be encouraged, it will prove of particular advantage to this country, as the woollen manufacture ſeems to be on the decline. Children of ten, or eleven years old, are very capable of making the hats. One of Mr. *Pepperell*'s daughters of that age, works very expeditiouſly at it. Mr. *Pepperell* has certainly taken great pains to find out the proper wood; and I hope his induſtry and ingenuity will be thought to deſerve attention. I have ſeen the inſtruments he uſes, and the whole proceſs of his manufacture, which I verily believe to be of his own invention.—I had forgot to mention, that his firſt attempt to make hats began upwards of two years ſince. If the Society ſhould require any farther information, I ſhall be very happy to give them all in my power, either by letter or in perſon, as I ſhall be in London in ſix weeks.—I am very reſpectfully, Sir,

Your moſt obedient humble ſervant,

CHARLES RULE.

From

From the Light thus thrown upon the Subject, it appeared to the Society "That "the Work which can be done by Chil- "dren of ten or eleven Years of Age, may "give Employment to a number of Fami- "lies: And as the Hats are made expedi- "tiouſly, and are cheaper than thoſe im- "ported from abroad, the Fabrick muſt be "conſidered as a Matter of public Utility." And the Society, always attentive to promote ſuch Objects, Reſolved "That a "Bounty of Thirty Guineas be given to "Mr. *Pepperell*, for the Encouragement of "his Manufacture."

Some Members being deſirous to have that Species of (the white) Willow, from which the fine Chip for thoſe Hats was made; the Secretary was directed to write to Mr. *Pepperell* for an hundred Cuttings, at any reaſonable price, if he could give them without detriment to his Undertaking: in return to which requeſt, they were ſent with the following Letter.

Totneſs, March 20th, 1774.

SIR,

IN your obliging letter of the 10th inſtant, I had the ſatisfaction to find that the Society had voted the ſum of Thirty Guineas, as an Encouragement to perſevere in eſtab-

eſtabliſhing the Chip-Hat Manufactory.—As the Society have rewarded me with ſo liberal a bounty, I think it my duty to purſue all ſuch meaſures as ſhall be moſt conducive to the eſtabliſhing thereof, and will ſpare no pains, or expence, as far as my ability will admit, to bring the ſame to perfection.

I moſt humbly thank the Society for the encouragement they have given me; and in particular that Noble Lord who filled the chair, for pointing out ſuch meaſures to bring the hats into repute.—

I have ſent directed, one hundred cuttings of the beſt ſpecies of willows ever diſcovered by me, which the Society are kindly welcome to.—The two dozen of hats ſhall be ſent ſoon; but as it is juſt on the coming in of the new crop of willows, I think beſt to defer it till I can produce them of that crop, which I believe will be far ſuperior to any ever yet ſeen.

I muſt deſire you to keep the hats that are with you, till the two dozen arrive; as I would not, on any account, have them worn before the very beſt be ſeen.

Our chief magiſtrate (Mr. *Rule*) will call on you next week, I have deſired him to receive the bounty for me; and I remain,

Sir,

Your moſt obliged
humble ſervant,
JOHN PEPPERELL.

April 8th, 1774.

"The thanks of the Society were ordered to Mr. *Pepperell*, for the preſent of "One Hundred Cuttings of that ſpecies of "Willows which he had found moſt proper for his Manufacture of Chip Hats;" and ſoon after, the Bounty was paid to Mr. *Rule*, as deſired.

LETTER ſetting forth the Diſcovery of an improved mode of refining Pig or Caſt Iron from Britiſh Ores, into Bars fit for making Guns and Ship's Anchors, &c. And making an Offer to provide for Sale, the more clean White Iron fitted for ſmall Work, and intended to be generally introduced as a Manufacture at large, by Mr. JOHN BEDFORD.

To Mr. Secretary *More*.

17th Octob. 1775.

SIR,

IN the year 1767 I did myſelf the honour of writing to the late Mr. *Templeman*, on the Society's account, touching the advantage which the quality of iron metal, that guns, ſhip's anchors, &c. are made with, would receive, by bar iron being refined

fined to an extra degree of proof and quality; from the pig or caſt iron.—And by being made from a proper mixture of the great variety of iron ores which we have in England. Several improvements I have made of the common principles of refining, during the courſe of many years practice at large, have raiſed in me a deſire to eſtabliſh ſuch a work, as would produce bar iron of a more regular, certain, and well ſuited quality to the manufacturers of guns, anchors, and other principal purpoſes;—as likewiſe to make that more clean white iron, for which the Society have thought proper to propoſe an encouragmeent*.

In the year 1764 and 1765, I practiſed in the works of Valentine Morris, Eſq. in Monmouthſhire, the making of white iron from the pig, to improve the erroneous method of mixing all ſorts of good, and bad, old iron for this purpoſe.—I made ſeveral tons weight for various of the princi-

* The Advertiſement publiſhed by the Society ſets forth in the following words, what they mean to encourage: "To the Perſon who ſhall eſtabliſh a work of white "tough Iron, as free from impurities as poſſible, fit for "making of Barrels of Guns, Hilts of Swords, and "other purpoſes for which this ſort of metal is required; "and which will bear, when caſe-hardened, a poliſh "nearly as fine as hardened caſt ſteel: *Fifty Pounds.*— "Specimens not leſs than fifty-ſix pounds weight; to-"gether with the Proceſs uſed in preparing it; to be de-"livered, &c." at the time of making the Claim.

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pal manufacturers of Birmingham;—as Meſſrs. Bolton and Fothergil, for poliſhed chains and fine toys; Mr. Blockley, for locks, and poliſhed grates; Mr. Dowler, for poliſhed candleſticks; Mr. Green, for fine ſnuffers; Mr. Thompſon, for cork-ſcrews; Mr. Whately, for guns: ſome of theſe appear by the books of thoſe dates, which I have now brought to London, for the Society's inſpection; and which ſhew how far ſuch was perfect or not; they contain alſo my own rules (*then* ſtruck out after the trials at Birmingham) what alteration of ores, or caſt iron appeared needful to farther complete the improvement; and which ſeemed wanting only in the white iron.—But ſeveral very principal things in buſineſs enſued ſoon after, and alſo ſeveral times ſince, which prevented my attempts of having a work proper for the farther proſecuting and completing the buſineſs of making bar iron for theſe particular purpoſes; my own capital not being then equal to what making bar iron required.—But my ſituation is now convenient for erecting a refinery and forge for the purpoſe; I being ſituated near the ſea in South Wales, where I have both land, a coliery, and iron mines; from the neighbourhood of which, veſſels come regularly to the London and other markets;—I there-

fore

fore am now intending a work proper to ſupply bar iron for theſe purpoſes:—my preparation towards it may already be found to amount to a conſiderable value in iron tools, and in materials for the mills.

And as it appears by Mr. Templeman's letter to me, that the Society was at that time inclined to countenance theſe improvements, and I perceive that they have lately been pleaſed to offer a publick reward for improvements in this branch. I am from ſuch encouragement induced to deſire you will pleaſe to lay the caſe open to the Gentlemen of the Society; from which I have to hope, that as the matter is very intereſting to the public, and the expences attending the preparations and improvements of this weighty manufactory, are too conſiderable to be ſupported by one perſon; they may poſſibly ſee it conſiſtent with the Society's uſual mode of encouragement, to grant it ſuch favour or aſſiſtance as by a farther examination they may find it deſerving*; and which will always be acknowledged by

Sir,

Your humble ſervant,

J. BEDFORD.

* Mr. *Bedford* having eſtabliſhed no work, could not aim at any reward offered, nor be admitted a candidate, had

P. S. One of the guns, made by Mr. Whately, I have here for the Society's examination, which will ſhow the proof, that twenty pounds weight of fit metal, is able to ſtand, in ſhooting balls, over a greater quantity of the iron commonly uſed in guns*.

had he put in a claim: but the Society approving the Attempt to forward an Object pointed out as generally uſeful; "Reſolved to give Mr. *John Bedford* a Bounty "of Twenty Guineas, as an encouragement to his "farther proceeding in the improvement and eſtabliſh-"ment of a Manufacture of Tough Iron from Britiſh "Ore." And the Advertiſement for the Premium was continued as before.

* The Barrel of a Gun being produced as a Specimen of the improved Iron, the Society thought proper to give Mr. *Bedford* Five Guineas for it, in order to have it kept for inſpection in their Repoſitory.

Diſcovery of the Conſtruction of a Machine for preventing the ill Effects of the Fumes of Mercury riſing in the Operation of Water-gilding upon Silver, Copper, and other Metals: by Mr. J. HILLS.

To the Preſident and Members of the Society for the Encouragement of Arts.

MY LORD AND GENTLEMEN,

I thought it neceſſary, at the introducing of the Model, which I hope will be found a preventive againſt the ill effects of Mercury in Water-gilding, to endeavour to explain its uſe, as follows—

The injury received, is at the time the work remains out of the fire, from which ariſes a viſible vapour impregnated with the groſſeſt part of mercury, which, for want of proper conveyance, the workman muſt inevitably receive each time he breathes; to prevent thoſe ill effects, I have contrived a pair of bellows which immediately draw the effluvia that would otherwiſe diſperſe about him. The tin receiver, in which runs a tube from the bottom of the bellows, is to receive that part of the vapour which the valve of the bellows repels every time it goes down. This is made of tin,

but would be found more efficacious, if made of common copper, gilt on the inſide with leaf-gold, by reaſon of the mercury adhering thereto. It is perhaps proper to mention, what otherwiſe may be thought an inconvenience, namely, the blowing of the bellows, which may be done at any time by a boy: but as it is not ſo laborious as the treading of a turner, and many other ways of buſineſs, perſons ſo inclined may work them with a ſtirrup, without other aſſiſtance, and will find great benefit by the moderate perſpiration it will in courſe bring on: to which a farther precaution might be added, that, if the workman chuſes, he may put a piece of gold in his mouth and noſtrils; but every continued obſtruction to breathing in the manner that nature has ordered, muſt prove detrimental to the conſtitution; therefore, upon the whole I diſapprove of ſuch practices. The glaſs, which I have made to take off and bring on, as occaſions requires, will ſupply them. I have ſtill added one of a different make, on a plan which I think in the largeſt ſort of work will be found moſt effectual; a draught of which I have annexed to the model, and will here briefly deſcribe. It is a frame glazed to go all round the tin receiver, and come down as low as the perſon's lap; two holes with valves, made of

leather, receive the arms, and will not be found inconvenient in working, by reaſon that the ſhirt-ſleeves are then always up. —Having thus far deſcribed the principal parts of this model, ſhall leave it to your better judgment; and if approved, will give great pleaſure and ſatisfaction to,

Gentlemen,

Your moſt obedient humble ſervant,

Roſoman's Row, Clerkenwell,
Dec. 9th, 1773. J. HILLS.

EXPLANATION.

To give a diſtinct Idea of this Invention, a more circumſtancial Deſcription muſt be attempted; and the intended Application being therewith likewiſe ſhewn, a better judgment of its utility may be formed. It is generally underſtood, that the gilder is placed before an open furnace or raiſed fire-place, putting in and taking out alternately the pieces of metal that are gilding. The memorial points out, that the injury received, is during the time the work is out of the fire—The reaſon of that is obvious; the workman is then bruſhing, or laying on more amalgama, holding the piece almoſt under his noſe; and as a ſmall degree of heat raiſes mercury into fumes; it readily occurs, that the heat of the metal forms that noxious vapour which he receives into his lungs every time he breathes; unleſs

leſs it be diverted by ſome current of air; and then its baneful effect may, in a leſs degree, ſpread in the room, ſtill be felt by him and thoſe who are obliged to be with him.—To remove all that miſchief, the inventor has thought of collecting the noxious vapour together, and conveying it directly up into the chimney.—To do this he has contrived a funnel fixed againſt the breaſt of the chimney, over the ſpot where the work is held during the operation, and from which the fumes muſt riſe into it. This funnel, or receiver, as he calls it, is as to ſhape, like a common, wide, flatted, tin tube, with a joint or return in the upper part, carried through the brick-work into the flue, as a channel of conveyance into the chimney—But the aſcent of the vapour being ſlow and uncertain, without a draught of air to lead it up; he has farther contrived a tin pipe, one end of which is fixed in the lower part of the funnel, and the other in the valve or draught-hole of a large ſized bellows, reſting upon the upper part or returned joint of the funnel, and having its nozel led (over the funnel) through the brick-work into the flue—The effect of thoſe bellows is to draw up and force the floating fumes into the chimney; and that is obtained by the operator's working them with his foot, by means of a line faſtened to the upper handle of the bellows, and carried over a pulley ſkrewed into the ceiling, or into a piece of wood projecting from the chimney, and thence brought down and tied to a ſtirrup, with which it is moved up and down like a treadle.—Another part of the invention, is a glazed frame or window-ſaſh, placed between the ope-

rator and his work, to ſkreen him from the approach of the noxious fumes; it is either ſtraight and of the breadth of the chimney, without a return, and made to ſlide up and down; or elſe, as he ſays, for large work, made circular and of a ſize to encompaſs the funnel and cloſe againſt the corners of the chimney; and then, inſtead of a ſliding part, to have in front, two of the ſquares not glazed, but lined with leather ſleeves for the arms to paſs through to the work; which by either of thoſe modes of prevention, he aſſures, may be done without hurt to the health of the operator.

The ſubject of the Memorial and the Invention diſcloſed by the Model, being taken into conſideration; the Society reſolved, That a Machine of a proper ſize for a common chimney, ſhould be conſtructed at their expence: and Mr. Platts, a workman in the water-gilding way, being found willing to make the trial, the machine was put up in his room; and a day being fixed, ſeveral members of the Society went to ſee its effect, and reported, that they had not felt any of the, ſo called, ſweet vapour during the operation: after which the following Letter was received by the Secretary.

To Mr. *More.*

SIR,

HAVING been informed, it was neceſſary that I ſhould deliver my opinion, of the Machine for preventing the ill effects of Mercury in Water-gilding; I have the pleaſure to inform you, that I have made uſe of it ever ſince the trial, and wiſh I had been ſo happy as to have had the uſe of ſuch an invention twenty years ago; I make no doubt but I ſhould have been free from the diſorder I have ſo long laboured under. As the Gentlemen have been ſo indulgent as to favour me with the opportunity of experiencing theſe ſalutary effects, I ſhall from gratitude be ready to inform every perſon of the conſtruction of the machine, as far as lyes in my power.

I am, Sir,

your humble ſervant,

M. PLATTS.

Upon the confirmed Report, and the additional Circumſtance of *cheapneſs and ſimplicity of Conſtruction*, recommended in the Advertiſement *for the preſervation of the health of poor workmen*; it was reſolved, that the Candidate, Mr. *J. Hills*, was juſtly entitled to the Premium, being Twenty Guineas, offered for diſcovering to the Society an effectual Method of preventing the ill effects in Water-gilding Silver, Copper, or other Metals.

N. B. Mr. *Hills*, originally a Seal-engraver, ſince moved to No. 82, Berwick-ſtreet, Soho, keeps a ſhop of Natural and Artificial Curioſities; and of Glaſs ſtained by his particular invention.

Account of ſome Methods of cleaning and taking Stains out of Ivory; and Trials of reſtoring an agreeable Colour to it, when become Yellow by time: propoſed to the Society in Claim of a Premium offered.

A Candidate, whoſe anonymous communications had an appearance of merit, being called forth to eſtabliſh by Proof the pretenſion founded upon what was propoſed to be diſcloſed; the information received either verbal or in writing from the diſcovered Claimant, Mrs. *Johanna Krulle*, was in ſubſtance as follows:—

"That ivory ſoiled, and not much diſ-
"coloured, may be cleaned with a bruſh,
"and a ſtrong lather made of old hard
"ſoap and water *."

"That a ſafe way of reſtoring delicate
"pieces of ivory to a good colour, is to
"bleach them under a glaſs in the ſun,
"after waſhing and farther frequently wet-
"ting them with milk-whey, made with
"lemon juice, or cream of tartar."

* Where this lather proves inſufficient, it is probable that the addition of a little pearl-aſh, will make it active.

"That

" That all acids, vegetable or mineral, " are of ſervice, when properly uſed*: that " the ſtronger kinds are to be diluted; and " the weaker to be oftener applied: both " to be waſhed off, and the piece im- " merſed in water, to kill the acid, as is " commonly ſaid."

" That ivory, which is not of the deepeſt " yellow, is to be cleaned with *ſpirit of* " *ſoap*, a compoſition offered by the candi- " date, and made in the following man- " ner:"

" Take Caſtile ſoap of the fineſt white " ſort, four ounces, ſhave them down, " and diſſolve them, in a cloſe ſtopped " bottle, and without heat, in rectified " ſpirit of wine, two pints: ſhake the " bottle twice a-day, and when no more " than a coarſe ſediment remains, pour " over the ſolution into another bottle, " and keep it well ſtopped.—when it is " wanted, a little at a time is taken out, " and it is applied cold, with a ſoft " bruſh."

" That ivory, when much diſcoloured, " and of a deep yellow, may be brought

* Spirit of ſea-ſalt, either ſtrong or diluted, is uſed to clean ſea-ſhells that have loſt their colour; the effect being obtained, the ſhells are put into clean ſoft water, whence being taken out, they are dried with a ſponge, rather than ſpread out to drain.

" white,

" white, by the uſe of a *lye*, alſo offered by " the candidate, and made as follows:"

" Take wood-aſhes, or pearl-aſh, and " make a good lye of them with water; " let it ſtand a while, then ſtrain it off " and keep it in a bottle: when it is to " be uſed, pour out a tea-cup full of it, " and to that quantity add, of ſtrong " ſpirit of vitriol, ſix drops; after which " employ it immediately.".

" The piece to be cleaned, is to be " ſteeped in this liquid for half an hour; " then taken out to be well waſhed with " the ſpirit of ſoap and a ſoft bruſh; and " this treatment is to be repeated, till the " deſired colour be obtained."

" That when ſpots on ivory are like " iron-moulds, theſe compoſitions ſhould " be aided by the addition of ſome *ſalt of* " *wood-ſorrel*, which is to be rubbed on " thoſe places, intermediately between the " ſteepings and waſhings."

The Proof required by the Society, was that the Candidate ſhould with the Liquids ſent in, namely the two Compoſitions above deſcribed, clean ſome pieces of diſcoloured Ivory given her for that purpoſe. She undertook the work with confidence, and brought the Ivory to a better colour than was obtained by thoſe who tried the Liquids before ſhe was called in; but ſhe could

could not reſtore to them their original Colour. Nevertheleſs the Society, willing to encourage the attempt, and diſpoſed to publiſh what was revealed, for temporary uſe, till ſomewhat more effectual be diſcovered,—reſolved to aſcertain the genuineneſs of the Recipes of the two Liquids, which had been uſed with that degree of ſucceſs.—In the Operation, the firſt, being the *Spirit of Soap*, was well made, and proved good; but the ſecond, called the *Lye*, did not appear equal to that ſent in; and the Candidate being informed thereof, then ſaid, that unleſs the lixivium were made ſtrong, and the Oil of Vitriol be of the pureſt, the compound would ever be of an inferior kind. This circumſtance being attended to, the next proceſs produced a lye equal in effect to that ſent in.

The ſalt of wood-ſorrel was not tried, on account of the difficulty of getting any that was genuine, at that time.

The Society then proceeding to conſider what Reward ſhould be given to the claimant of the Premium, for her time, trouble, and partial diſcovery, the object of the Advertiſement not being fully anſwered: it was reſolved "That a gratuity of Ten "Guineas, a ſum equal to one half of the "Premium offered for an effectual Method, "ſhould be given to Mrs. *Johanna Krulle*, "for the Communication of her Method "of cleaning ſtained and diſcoloured Ivory."

EXPLANATION

Of the expeditious, cheap, and effectual *Method of Embanking, and Stopping up Breaches in Banks and Dams, to prevent the overflowing of Lands by the Sea, or by Rivers*; imparted to the Society by Captain PAGE, and inſerted in this Volume, page 282 to 287: upon reviſion of which Account the Captain has favoured the Editor with the following Letter.

SIR,

A Tour I have been upon, along the Coaſt, has prevented my ſending the encloſed as ſoon as I intended, in conſequence of your obliging favour.

I think the general idea for ſtopping Breaches, whether in Sea or River Banks, delivered to the Society, and for which they did me the honour of giving it their approbation; is as correct as I can make it: but as it is abſolutely neceſſary in ſuch explanations, to refer to drawings of ſections, and particular parts, they ought to be executed in the diſtincteſt manner, otherwiſe the ſubject cannot be properly underſtood. The Engraving printed with the Memorial, does not convey ſo clear an idea as I could wiſh it to offer; it being impoſſible to diſtinguiſh the Faſcines from the Earth (or Clay) or the manner of laying

or

or hedging them in the different rows: I would therefore recommend what I herein encloſe, to be copied with great care; which will ſerve as a reference to explain the ſubject, and will, I hope, anſwer every end the public can deſire; and be ſatisfactory to the Society, to whom I ſhall always be happy to communicate any diſcovery that may be worthy their notice.

The Breakwaters made at Sheerneſs and Dover, are exactly ſimilar to the outſide (or towards the ſea) of the large Dam (*a*—*b*) in its finiſhed ſtate; with a conſiderable quantity of ſea-beech, ſhingle or ſmall ſtones, thrown in among the faſcines, which by the action and re-action of the water, mix with the ſmall branches of the wood, and become exceedingly firm and durable; anſwering every end of ſuch works infinitely better, than heavier and more expenſive materials.

I have indeed the ſatisfaction to find theſe Breakwaters anſwer far beyond my expectation; that at Dover having not only ſaved the batteries, but alſo a conſiderable part of the ſhore uſed for ſhip-building; which otherwiſe muſt inevitably have been carried away by the raging tides we have had of late.

There are two advantages ariſing from this method, over that uſually practiſed; which are, Cheapneſs and Diſpatch; as I am fully convinced that the Breakwater we have

have made in ſix weeks at Dover, would have required ſome years, with doubtful ſucceſs, if done according to the old eſtabliſhed cuſtom of theſe places.

I remain, &c. THOMAS HYDE PAGE.

REFERENCE to the PLATE, explaining the Proceſs of the new Method of Embanking and Stopping Breaches.

The large Dam *ab*, *cd*, repreſented in its finiſhed ſtate, at low water, ſhews how firmly it is fixed to the ſides and to the bottom of the Breach; which, by the deſcribed method, is done with equal eaſe, whether the ground be dry or wet, and with the water running in and out.

Iſt Section, *e* through *cd*, ſhews the firſt proceſs of the work; the run of water with the Ebb tide, and the manner of placing the Faſcines.

IId Section, *f* through *cd*, ſhews the Dam carried higher; the Ebb falling over the work. N. B. The interior faſcine work, might at this period be diſcontinued.

IIId Section, *g*, through *cd*, ſhews the Dam raiſed to its height, and finiſhed. The interior upper rows of faſcine work, ſerve only to ſupport the weight of the Earth.

IVth Section, *h* through *mn*, ſhews the method of ſtopping Breaches, of a trifling nature, *ii*, in a ſingle Tide; or where water runs only one way. The dotted line contains the Earth behind the Bruſh-wood, faſtened by the ſtake *o*.

N. B. The Bridges, particularly thoſe in the center, are of eſſential uſe for tranſporting materials to the body of the Dam.

FAR-

FARTHER CONSIDERATIONS

On the application of Faſcines in Embankments, Breakwaters, &c.

THE ſea-bank made near Portſmouth, to incloſe a conſiderable quantity of land, by Mr. Taylor; having already been explained, nothing farther (where ſimilar attempts are neceſſary) ſeems wanting on the ſubject: a ſtrict attention to the progreſs of that undertaking will, it is preſumed, be ſufficient to direct whatever may be required under prudent conſiderations. The ſucceſs of that work was certainly of the utmoſt conſequence to the proprietor, a conſiderable part of his eſtate depending on it; but the ſeveral failures and accidents, previous to the application of Faſcines, were found ſo frequent and expenſive, and ſo cloſe an attention is required, even in the laſt and ſucceſsful ſtage of the buſineſs, as ought to deter private individuals from projects of a like nature; unleſs urged to enter upon them, by the moſt deſperate circumſtances. The great advantage that ſeems to be derived from Mr. Taylor's banks, if well underſtood, is that works of leſs magnitude, where inferior powers of water are to be contended with, may be undertaken with great confidence of ſucceſs, provided the proceedings in the different ſtages of operation,

ration, have been properly conſidered; upon which great ſtreſs muſt always be laid, as a previous and perfect knowledge of every circumſtance muſt be attained; without which Faſcine-works will be as likely to fail, as any other ill-managed undertakings.

It is not to be ſuppoſed, that Mr. Taylor's Plan will be exactly applicable to every future attempt: different ſituations, currents, or prevailing winds, may require conſiderable deviations: it is therefore the more neceſſary for the perſon who directs ſuch works, to have a very extenſive knowledge in the various methods of uſing faſcines, where unexpected dangers may appear; without which, and a very quick deciſion, the beſt concerted plans will fail. Thus far, it is hoped, will be ſufficient to make projectors properly cautious; as the beſt and cleareſt directions will not be a ſufficient guide, without the cloſeſt attention during the progreſs of the work, in which the ſmalleſt omiſſion may deſtroy the whole.

One great advantage to be drawn from faſcine-works, is in the making Break-waters, which are frequently required for the preſervation of fortifications, piers of harbours, &c. on expoſed parts of the ſea-coaſt. The difficulties attending the execution of theſe works, are by no means ſo great as in the incloſing land from the ſea, or embankments of rivers; although gene-

rally

rally ſuppoſed to be more ſo: in theſe works there is no danger of a back-water, tending to undermine the foundation; the only thing to be feared, being the ſurf of the ſea, which, in expoſed ſituations, is very deſtructive, where proper Plans have not been adopted.

The uſual fault in the conſtructing of Break-waters, is the want of a proper ſlope, or obliquity, to the ſhock of the ſea; they are alſo, in general, compoſed of improper materials. It is only neceſſary to mention the garriſon of Sheerneſs, which in a great meaſure exiſts by the preſervation of Break-waters. They were formerly compoſed of wood and ſtone; and although rendered, by the judgment of Engineers of experience, as perfect as ſuch things could make them; it has been found, that the laſt adopted Plan with faſcines, is not ſo expenſive, nor ſo liable to breaches of the ſea, as the former. This Break-water is of the moſt ſimple nature, being only to reſiſt a rough ſurf in front; and, conſequently, the more oblique its ſlope, the greater its ſtate of ſafety. The ſketch on the following Plate will nearly ſhew the conſtruction.

At Dover they are of another nature, and infinitely more difficult to make, ſo as to anſwer the deſired end.—The ſmall ſtones (called *Sea-beech*) with which that

part of the coaſt is covered (and particularly near the mouth of the harbour), are in a continual ſtate of motion, according to the prevailing winds; it being common, at certain ſeaſons, to ſee vaſt quantities of them in hills along the ſhore; and in a few months after, the whole waſhed away, and the moſt expoſed parts of the town in danger of being deſtroyed by the inroads of the ſea: it is therefore neceſſary, in ſuch a place, to know what winds are moſt deſtructive to the coaſt; which being well aſcertained, the break-water is nothing more than a jettée, or ſaliant projection into the ſea, to prevent the motion of the beech, as long as poſſible: to effect which, nothing can anſwer ſo well, or at ſo little expence, as a faſcine-work. It has been ſufficiently tried at that place for the preſervation of a Battery, erected on an expoſed part of the beech.—It was neceſſary to place it in that dangerous ſituation; but before it was finiſhed, a ſtrong eaſterly wind ſet in, for a conſiderable time, and would have deſtroyed the Battery, by the ſudden ſhifting of the Beech; had not a faſcine jettée been carried out, with the utmoſt diſpatch, to check its progreſs.

The ſucceſs ſurpaſſed all expectation; and notwithſtanding the moſt raging tides, and worſt ſeaſon of the year for ſuch works, it was completed without the leaſt acci-

dent; the ſea appearing rather to aſſiſt, than retard the operation. The Battery was not only ſaved, but alſo ſome Buildings and a large Veſſel then on the ſtocks.

The ſlopes of theſe jettées, muſt be gradual, to oppoſe as little reſiſtance as poſſible to the ſurf, that with certain winds rolls along the ſhore.—The line on the upper ſurface of the Break-water, towards the ſea, muſt not be horizontal, but parallel to the fall between the high and low water-marks; the reaſon for which is, that a wind and ſea ſetting directly upon land, may not be too much reſiſted; as the work ſhould admit the ſurf to paſs over it with as great eaſe, as it could do on the ſea-ſhore.—In common practice, a horizontal line is carried out into deep water, with the ſides ſteep; whence ariſe dangers in the execution; foundations deepened, or waſhed up, and other evils, that are conſtantly attended with uncertainty of ſucceſs, and heavy expence.

Theſe obſervations, it is hoped, will make works of this nature appear of more general utility; and be found far leſs expenſive than they have been heretofore.

T. H. P.

Abſtract of the *Communication of a Method for Improving Waſte-Land*, by Mr. William Lunsdale, of Hawſwell, near Bedale, Yorkſhire, which obtained the Premium of a Gold Medal.

IN the year 1764, Mr. [illegible] Dunſdale, a conſiderable farmer, encloſed about two hundred Acres of Turf-land, covered only with *Ling*, or Heath. He parcelled them out, wet or dry, for different experiments; and beginning with a dry part, ploughed, harrowed, ſowed ſeeds of eaſy growth; and laid the ground open to the effects of the different ſeaſons. He proceeded next to manure it, trying alternately, pigeon-dung, ſoot, and lime; but without much effect; ſomething eſſential was wanting: aſhes perhaps! but wood-aſhes the moſt promiſing, were coſtly: it occurred to him to try thoſe obtained from weeds: to that end he harrowed up the *Ling* by the roots, and, when dry, he burnt it; with the ſods and clods, and all he could get together: and by two ſuch operations he had aſhes enough for each parcel of land. The ſucceſs that attended his undertaking, was owing chiefly to that diſcovery; and the practices that proved efficacious under his judicious direction, were in a few years reduced to the following: Firſt, on breaking ground, the *Ling* was ploughed and harrowed out, and the land being then croſs-ploughed, was left to dry, from the earlieſt part of ſpring to May; when, all that could produce aſhes, being burnt, and mixed with eight, ten, or twelve quarters of lime, per acre, was ſpread, ploughed, and harrowed in. Then about the end of the ſame month, or the beginning of June, as the weather allowed,

7. Turnep-

Turnep-ſeed was ſown, and gave a moderate crop; but being eaten off by ſheep, the land was improved; and the ſecond crop, with once ploughing, harrowing, and manuring, proved more abundant; this alſo being fed off, the ſoil became fit to receive graſs-ſeed; and that again, at a proper time being cropped off, the land was brought by degrees, to a firm and fine ſtate of paſturage. Mr. Dinſdale kept an exact account of the expence of all thoſe operations, which for the firſt year amounted to three pounds per acre: but the crop of turneps obtained from one pound of ſeed, being worth two pounds and ten ſhillings; the coſt of improvement was reduced to ten ſhillings. The labour of the ſecond year, was under ten ſhillings; and the crop being better than the former, repaid all diſburſes, and gave profit; the laying down for graſs, including the price of the ſeed, was likewiſe much overpaid by the crops, which ſoon became equal in value with thoſe of good old paſturage. The ſecond crops of turneps were often ſo rich, that of a quantity carried to a fair at Richmond, ſome weighed above ſixteen pounds ſingly: the product of the acre having beeen valued at four guineas. Of the graſſes ſown, none ſucceeded better, than the common hay and vernal-graſs ſeed mixed; and the rib-graſs with the white clover alſo mixed: the firſt crops of which were eſtimated at fifteen ſhillings. The experiments made upon the parcels of wet land, proved, that, they wanted draining, and more frequently turning up, from one ſeaſon to another; to fit them for an equal treatment with the dry acres: and theſe latter alſo, in wet ſeaſons, were found to require particular attention, when the ground was

not firm, and had a quantity of [illegible] in it that held water, and made mud. [illegible] Under ſuch circumſtances it was very improper to let heavy cattle eat off the firſt or ſecond crop.

Thus prudently conducting [illegible] undertaking, Mr. Dinſdale, in the ſpace of [illegible] twelve years, converted his encloſed bad land, [illegible] hundred acres of fine paſturage; ſixty acres he laid out in plantations; and the forty remaining he keeps in tillage, producing good wheat, and red clover. Theſe experiments were not loſt upon attentive neighbours; they tried them as he went on; and meeting with ſucceſs, they have encloſed and improved more than two thouſand acres. To the account of coſt of labour in preparing the land, Mr. Dinſdale adds a ſtate of the expence of incloſing; and, letting fancy-work aſide, he ſays, his common fence walls were made from ſix ſhillings to eight ſhillings and ſix pence per rood, as the ſpots required: but for the wet land, not fit to bear a wall, experience taught him to plant three rows of willows, the outſides of which ſtanding trellice ways, made a very good fence, and ſtanding too high to be cropped, gave fine ſhelter: that, coſt no more than three ſhillings a rood; and the ditches made main drains.—Finally he imparts another uſeful manure, made of the ſoils taken out of drains and ditches, and mixed with lime, about one chaldron, or from four to ſix quarters, to the quantity that ſhould go to an acre; forming an excellent compoſt; to be applied, for that containing moſt clay, upon the lighteſt ground; and that, which is of the looſeſt texture, to be laid upon the heavy ground.

A R-

ARTICLE XV.

A Liſt of Premiums, Bounties and Rewards, beſtowed on various Subjects in Drawing, Etching, Engraving, Painting, and Modelling, encouraged by the Society for the Improvement of Arts, &c. *and arranged under particular Heads, according to the progreſſive Age ſtated for the different Performances; from the time of the Inſtitution, to the Year* 1776, *in the*

CLASS OF POLITE ARTS.

[The Account of the firſt three Years, is given more circumſtantially than the following, to ſhew, that moſt of the Candidates who were repeatedly ſucceſsful at ſo early a period, are become profeſſed Artiſts.]

The firſt ſteps to call forth and reward juvenile diſplays in the Practice of Drawing, conſidered as a general element to all liberal Arts, were made in 1754, at a meeting of thoſe few Members that originally ſet on foot this extenſively uſeful Plan. It was then reſolved "That the Art of Drawing, "deemed eſſentially neceſſary to many "Trades and Profeſſions, was in a ſtate of "decline among us: that from a revival, "manifeſt advantages would ariſe: and "as gradual Encouragement, was likely

" to produce the effect, that premiums
" ſhould be offered to Boys and Girls
" incite them to become proficients; and
" that this Reſolution ſhould be made
" known by public Advertiſement, as fol-
" lows: the Society propoſe to beſtow,

" For the beſt Drawings (of any kind) by
" Boys and Girls under the age of Fourteen
" Years, on proof of their abilities, on or
" before the 15th day of January next
" (1755); to be determined that day fort-
" night," 15 Guineas.

" Likewiſe, for the beſt Drawings, by
" Boys and Girls, between the ages of Four-
" teen and Seventeen, with the like proof
" of their abilities, on or before the ſame
" day — to be determined that day fort-
" night," 15 Guineas —

It was underſtood, that the premium offered, was to be divided among the Candidates in proportion of the Merit diſcovered in their Performances.

Five Candidates were admitted to each of theſe Claſſes: and it is remarkable, that while the ſimpleſt attempts were allowed to be produced, ſingular exertions, beyond what was expected from the unpractiſed Years of the Claimants, appeared in the pieces brought in.

1755. In the firſt Claſs, under 14 Years of Age: *Richard Cojway*, then not 12 years old, gave in a *Head of one of the Furies*, expreſſing *Compaſſion*,

paſſion, do[illegible] in Chalks, and obtained the firſt ſhare of th[illegible] Premium.

Steadily purſuits, he is become a Royal Academician, a diſtinguiſhed Artiſt, and an eminent Painter in Portraits, either large as Life, or in Miniature. He lives in *Berkley ſtreet*, near *Piccadilly*.

John Swart, who alſo had not attained the age of 12, offered an *Academy Figure*, in pencil, for which he got the ſecond ſhare of the Reward.

He is at preſent F. S. A. one of the firſt Miniature Painters in London, and lives in *Berner-ſtreet*, near *Oxford Road*.

John Alexander Greſſe, about the ſame age, for a Drawing of an *old Warrior's Head*, in Chalks, had the third ſhare.

Aſpiring and ſucceſsful in farther Attempts, he ſoon gave proofs of a ſuperiority of Talents, for which he became employed to delineate ſome of the capital Pictures to be copied by Engravers; and he executed himſelf the neat Plates of the Collect. of Antiq. Stat. at Wilton-houſe. He taught Drawing early to many young perſons of faſhion; and lives in *Stephen-ſtreet*, *Rathbone-place*.

Miſs *Barbara Marſden*, ſtood next, (the encouragement being offered to either ſex of Candidates,) ſhe ſent in a Drawing in Indian Ink, *a Landſcape with a Cottage ſurrounded by Trees*, neatly done, and had the fourth ſhare allotted to her.

It may juſtly be inferred from her obtaining ſeveral ſubſequent Rewards for Compoſitions of Flowers after Nature, that the free uſe of her pencil would have made her a proficient in the Art, had ſhe not given up thoſe amuſing purſuits, for the more eſſential duties of a married life. She became the Wife of *Jeremiah Myer*, Eſq. an elegant Miniature Painter, of whom farther mention will be made, among the Honorary Rewards in the year 1761, when he obtained the Prize for the beſt Profile Portrait of His preſent Majeſty.

John Aſhwood Porter, for an outline with pen and ink, *Boaz and the Servant ſet over the Reapers*, received the remaining ſhare of the 15 Guineas.

He

He was Son to a Drawing-maſter in [illegible]; but his name not appearing farther on the Regiſter, it is ſuppoſed, that other inducements have led him to a different kind of occupation.

The five young Perſons, who [illegible] the above Premium, were inſtructed by and under the direction of Mr. *William* [illegible], then a Landſcape Painter, who, from a well grounded perſuaſion of the extenſive Utility of the Art of Drawing to this nation, erected the Academy in the Strand, oppoſite Exeter Change; where, by his zealous aſſiduity, and the diligent attention of Mr. *Henry Pars*, his ſucceſſor and the preſent conductor of the School, the greateſt number of Contendants for the Rewards of this Inſtitution were formed, during the firſt period of years.

The ſecond Claſs of Candidates, limited to be under the Age of 17 Years; had the choice of the ſubjects left to their option; were to divide 15 Guineas; and ranked in eſtimation as follows:

James Scouler, about the age of 14, offered a *Drawing* in Chalks, *a Head of an Uſher in the Drawing-ſchool*, done from the life, for which was adjudged to him the firſt ſhare of the Reward.

This young man is at preſent an eſteemed Miniature and Portrait Painter, and lives oppoſite the Britiſh Muſeum, in *Great Ruſſel-ſtreet, Bloomſbury*.

Miſs *Elizabeth Keith*, about the ſame age, produced a Drawing, *the Head* of *St. Peter, after Piazzetta*, and obtained the ſecond ſhare of the Premium (none of the honorary kind being then yet propoſed for Perſons of Quality.)

She

She was daughter to a Lady of the Mareſhal Family, which, on account of political Sentiments and Events, was not then in a ſtate of affluence. The young Lady gave early proofs of Genius and Talents, of which, perhaps, ſhe might have availed herſelf in future, had not a premature death put an untimely ſtop to her purſuits.

Elias Durnford, much of the ſame age, gave a Drawing, a *Compoſition of Flowers*, ornamentally diſpoſed, his own Invention, and got the 3d ſhare.

To the Talents of drawing flowers and figures, he ſoon added the Practice of geometrical and perſpective Plans, and thereby indulging his genius, he fitted himſelf for a Profeſſion which he was ambitious to follow. He became an Engineer, and acquiring rank, by diligence and abilities, was ſent out to America, Captain of Engineers, with the Commiſſion of Lieut. Governor of the Province of Penſacola.

Richard Dubourg, at as early a period as the preceding, ſent the Drawing of *a Head* of *St. Paul*, done in the ſame manner as that of St. Peter, and had the fourth ſhare.

After ſome more exerciſe in deſigning, he made it his ſtudy particularly to delineate Buildings of remarkable Architecture; and during a reſidence of ſome years at Rome, he took ſuch minutely accurate Plans, Elevations, and Sections of many venerable remains of Antiquity, as ſerved for conſtructing, with a material ſo happily adapted to the purpoſe, as Cork, ſeveral Edifices and Ruins expreſſively reſembling their originals. Thoſe performances are actually with him, admired by all curious and intelligent perſons, at the corner houſe of *Duke and Edward's ſtreet, Portman-ſquare.*

Richard Revel, at an age below that fixed for this Claſs, preſented a Drawing in Chalks, of *a Horſe, from the life*, for which he received the remaining ſhare of the ſum offered.

His ſtation in life not permitting him to give up a ſufficient part of his time to cultivate the talent he might have for a particular line in drawing, it is preſumed, from his

his not appearing again on the Liſts, that he has purſued ſome other occupation.

Of this ſecond Claſs of Candidates the majority were inſtructed by Mr. *Jacob Bonneau*, an able and intelligent drawing-maſter, particularly converſant in the eaſy method of teaching Perſpective, of which ſome neat ſketches he has preſerved, beſides pleaſing proof; they were done by Ladies of Diſtinction, much about the time here ſpoken of. He lives in *Charlotte-ſtreet, Rathbone-place.*

1756. The Rewards for the Year 1756 were offered in Polite Arts, to three Claſſes of Claimants, admitting five to the diſtribution of 15 Guineas for every ſubject propoſed: with the particular reſtriction, that where a double Adjudication happened to fall to the lot of one Candidate, during the concealment of his name, he ſhould, upon diſcovery, be held to chooſe of the two Rewards that which he liked beſt, and relinquiſh the other.

The firſt Claſs, as to its object, was a repetition of that deſcribed in 1755, for the *unexperienced* age of 14 years; the reward offered, was divided in the following manner.

John Smart, (of 1ſt Claſs, 1755) for the drawing of a [illegible] in Chalks, the firſt ſtate.

William [illegible], for a Drawing of a Head of *Laocoon*, in Chalks, the ſecond ſtate.

This

This Candidate, a Brother of the Maſter of the Academy in the Strand, is now profeſſionally a Portrait and Hiſtory Painter, reſiding at Rome.

Lewis Pingo, (3d Son of Thomas Pingo) for a Drawing of *the Head of a Man* looking ſternly over his ſhoulder, in red Chalk, the third ſhare.

By Father and Brothers, this *L. Pingo* belongs to the Arts, the Family having done honour to them in ſteady purſuits, as will be ſeen in the ſequel of this Liſt.

Simon Taylor; for a Drawing, *the Head of a Rabbi*, pen and ink, the fourth ſhare.

Diligent in contending for more Rewards, with a predominant diſpoſition for Botanical Performances, he became and is at preſent employed that way, by a Nobleman eminent for his knowledge in various branches of Polite Arts and Literature.

Miſs *Barbara Marſden*, (of Cl. I. 1755.) for a Drawing in black and red Chalk, *the Head of an old Woman*, the remaining ſhare.

The ſecond Claſs of Candidates, under 17 Years of Age, divided the propoſed Premium, in the following order:

John Hall, for a Drawing of a *Human Figure after Pine*, in Chalks, the firſt ſhare.

Continuing maſterly in his performances, and applying particularly to the Art of Engraving, this Candidate ſoon became diſtinguiſhed in that line, and is at preſent F. A. S. employed in ſome of the moſt important publications—He is reſident in *Berwick-ſtreet, Soho.*

John Alexander Greſſe (of Cl. I. 1755), for a Drawing of an Academy Figure, the ſecond ſhare.

William Pether, for a Drawing, a Portrait of a Perſon in a Spaniſh Dreſs, with Pen and Ink, got the third ſhare.

This Candidate, ſoon able to draw from Pictures for Engravings, became a Painter, and afterwards a Mezzotinto Engraver of note, improving alſo a talent for Miniа-

Miniature-painting. His principal residence is in Town, although great part of his Studies have been pursued in different places in the Country. (He is now in *Frith-str. Soho.*)

Miss *Elizabeth Brown*, for a Drawing of *a Head in an ornamented Bracket*, in Bister, the 4th share.

James Wood, for a Drawing of *an Academy Figure*, in Chalks, the remaining share of 15 Guineas.

[illegible] Third Class, the Candidates, allowed to be [illegible] the Age of 20, were to produce [illegible], and *Compositions* of [illegible] with *Flowers*, *Fruit*, and *Foliage*, [illegible] Drawings were meant to be of use to *Fabrics* and *Manufactures*, but not being susceptible of Description, are here recorded briefly in the order of adjudication.

Elias Durnford (of Class II. 1755) the 1st share.
Henry Pingo (second Son of Thom. P.) 2d share.
Thomas Davies (of the Artill. at Woolw.) 3d share.
William Pars (of Class I. 1756) — 4th share.
William Pether (of Class II. 1756) F.S.A. 5th sh.

1757. The Advertisements for the Year 1757 proposed Rewards for a greater variety of subjects; but the Classes above mentioned appeared principally resorted to; and the last named, very suitably, became a field of contention for young Ladies, who, like the youths, were admitted five in a Class, to divide proportionably the 15 Guineas offered.

In the first Class, under the age of 14, the productions allowed to be of *any kind*, obtained the sum allotted, as follows:

William Pars, (of Ist Class, 1756) for an Academy Figure in Chalks, the 1st share.

Wil-

William Parſons, (ſince a Portrait Painter) an Academy Figure in Chalks, had the 2d ſhare.

Richard Harlom, a Head after Piazetta, 3d ſh. He was ſoon employed to delineate Pictures for Engrav.

Johnſon Carr, Son of a Capt. in the Army, an Academy Figure, in red Chalk, the 4th ſhare.

William Lookes, Herald Painter, Doctors-commons, a lying Figure, from a Drawing, the 5th ſh.

Claſs under 17 Years, for the beſt Drawings, of *any kind*.

John Smart, (of Iſt Cl. 1755) a Portrait, in Chalks, of Mr. Will. Shipley, the Inſtitutor of the Society, 1ſt ſhare.

Simon Taylor, (of Iſt Cl. 1756) Queen-ſt. Gold. ſq. a Landſcape with Cattle, black pencil, 2d ſhare.

James Gandon, (ſince an Architect) Broad-ſtr. Carnab. Market, an Acad. Figure, in Chalks, 3d ſh.

William Lifford (Aſſiſtant in Mr. Pars' Academ.), a Roman Head, in red Chalk, 4th ſhare.

John Edwards, Hiſt. Painter, at Bow, Middleſex, a Man's Head, after Baſta, in Chalks, 5th ſhare.

Claſs under 17 Years, for the beſt *Fancy-Deſigns*, or *Compoſition of Ornaments*:

Iſaac Martell, Silk-weaver, Spittal-fields, 1ſt ſh.

Richard Coſway, (of Iſt Claſs, 1755) 2d ſhare.

John Greſſe, (of Iſt Cl. 1755) 3d ſhare.

Lewis Pingo, (of Iſt Cl. 1756) 4th ſhare.

Andrew Durnford, (Brother to *Elias D.*) 5th ſh.

The beſt fancied Deſigns, to ſerve as *Patterns for Manufacturers*, by Girls under 17 Years.

Miſs *Barb. Marſden*, (of Cl. I. 1755, 56) 1ſt ſh.

Miſs *Sarah Kirby*, of Kew, 2d ſhare.

Miſs *Hannah Chambers*, Milford-lane, Strand, 3d ſh.

Miſs *Mary Chambers*, ſame place, 4th ſhare.

Miſs *Eleanor Clark*, of Millbank, 5th ſhare.

For

1758. For the year 1758, the ſubjects propoſed were ſtill more varied, and the age of admiſſion took in the intermediate years of 15 and 16. In 1759, the ſubjects multiplied to forty—In 1760, to fifty, and ſo on, to the preſent conſiderable number: the years of the candidates were alſo gradually encreaſed from 19 to 25 and upwards, proportionably to the knowledge required for the performances; and in courſe the Rewards were likewiſe enlarged.

The firſt Claſs, for *Drawings of any kind*, under the age of 14. Open to *ſuch as had never been taught*, offered to each, according to merit, a ſhare of 15 Guineas.

John Ruſſell, afterwards Pupil of F. Cotes; now A. in Margaret-ſtreet, Oxford-road; *an Huſſar, after Worledge:* pen and ink, 1ſt ſhare.

Geo. Smithſon, Strand, *a Head from Raphael*, 2d ſh.

William Williams, ſince a Landſcape Painter, *an ornamented Vaſe*, 3d ſhare.

Edw. Waters, P. Inſpector, *an old Man's Head*, 4th ſh.

Benjam. Vulliamy, King's Watch-maker, Pall-mall, *an old Man's Head*, 5th ſhare.

1759. *Mich. Angel. Rooker*, A. Son of Archit. and Engrav. *an Academy Figure*, Gr. Ruſſel-ſtr. Bloomſb. 1ſt ſh.

John Ruſſell, a Beliſarius, after Strange, 2d ſh.

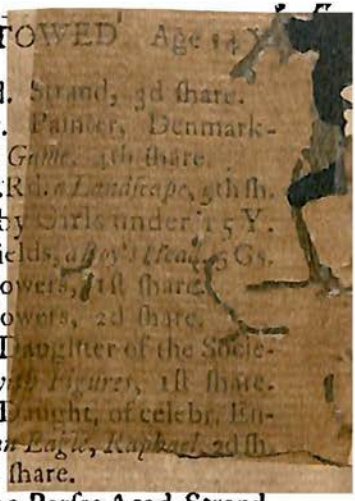
George Herbert, an Academ. Figure, 3d ſhare.

Hugh Barron, then Little St. Martin's Lane, ſince F. S. A. *an Academy Figure*, 4th ſhare.

Wm. Willis, Pup. of M. Shipley, *an Acad. Fig.* 5th ſh.

1760. Drawings of *any kind*, Human Figures and Heads excepted.

Geo. Hebert, Broc. Silk-weav. Spittal-fields, 1ſt ſh.
Franc. Adams, Strand, Portrait Painter, 2d ſh.
George Robertſon, Pupil of Mr. Shipley, *a Horſe from life*, 3d ſhare; and on re-eſtimation, for particular merit, 4 Guineas; and again the ſame....
George Robertſon, F. S. A. Titchfield-ſtr. 1ſt ſh. 1761.
Joſeph Collyer, Engraver, Iſlington, 2d ſhare.
Thomas Grignion, Watch-maker, Ruſſel-ſtr. Cov. Gard. *a Landſcape after Rademaeker*, Ind. ink, 3d ſh.
Johnſon Carr, ſelf-taught, *a Landſcape*, 4th ſhare.
Thomas Cook, Pupil of Ant. Walker, 5th ſhare.
Thomas Adams, Strand, Beaufort-builds. 6th ſh.
Robt. Dunkarton, Pupil of Mr. Pether, *a Dog's Head after Pars*, Mezzot. Engrav. Strand, 1ſt ſh. 1762.
Ralph Wewitzer, Pupil of Mr. Pars, 2d ſhare.
Thomas Brooks, now in the Law, Greek-ſtreet, Soho, *a Stag's Head after Pars*, 3d ſhare.
Andr. Thornthwaite, Ornam. Draftſm. Pupil of Mr. Pars, *a Landſcape after Perelle*, 1ſt ſhare. 1763.
Moſes Blanchard, Co. Ornam. Paint. Piccad. 2d ſh.
Ralph Wewitzer, Performer on the Stage, 3d ſh.
A. Thornthwaite, ſince an Architect, now in the Army, *another Landſcape after Perelle*, 1ſt ſhare. 1764.
John Alexander, Pupil of Mr. Parſons, *an Eagle perched devouring a Snake*, 2d ſhare.
James Jones, Engineer, abroad, 3d ſhare.
N.B. The remaining ſhares were not adjudged.
Richard Oakes, Portſmouth, *a Landſcape*, 1ſt ſh. 1765.
Charles Grignion, Hiſt. and Portr. Painter, Ruſſel-ſtr. Cov Garden, *a Moon-light*, in Chalks, 2d ſh.
William Wakelin, Silverſmith, Panton-ſtr. Haymarket, *a Cart, Horſe, and Driver*, 3d ſhare.
John Atkinſon, Marg. ſtr. Weſtminſter. 4th ſh.
Francis White, Engraver, Iſlington, 1ſt ſhare. 1766.
Charl. Reub. Riley, Engraver, Pupil of Mortimer, *Landſc. noon, after Pillement*, 2d ſhare.



William Price, Pars Acad. Strand, 3d ſhare.
Auguſt. Touſſaint, Miniat. Painter, Denmark-ſtreet, Soho, *Troply of dead Game*, 4th ſhare.
Joſias Smith, Statuary, Oxf. Rd. *a Landſcape*, 5th ſh.
Drawings of *any kind*, by Girls under 15 Y.
1762. Miſs *Alice Morriſon*, Moorfields, *a Boy's Head*, 5 Gs.
1763. Miſs *Elizab. Graham*, Flowers, 1ſt ſhare.
Miſs *Penelop. Graham*, Flowers, 2d ſhare.
1764. Miſs *Eliz. Soph. Tuckwell*, Daughter of the Society's Regiſter, *a Landſcape with Figures*, 1ſt ſhare.
Miſs *Mary Bruce Strange*, Daught. of celebr. Engraver, *St. John Evangel. on an Eagle, Raphael*, 2d ſh.
Miſs *Elizab. Graham*, 3d ſhare.
Miſs *Ann Pars*, Siſter of the Parſes Acad. Strand, *a Landſcape with Figures*, 4th ſhare.
Miſs *Penelope Graham*, 5th ſhare.
1765. Miſs *Frances Dixon*, Daugh. of Min. P. Bach, 1ſt ſh.
Miſs *Mary Bruce Strange*, Caſtle-ſtr. K. Mews, *Angel appears to Virg. Mary*, *Pouſſin*, 2d ſhare.
Miſs *Eliz. Soph. Tuckwell*, as above, *a Landſc. with the metamorphoſis of Iö*, 3d ſhare.
Miſs *Ann Pars*, *a Landſcape after Pouſſin*, 4th ſh.
Miſs *Sophia Burnet*, of Chelſea College, 5th ſh.
1766. Miſs *Frances Dixon*, ret. to America, 1ſt ſh.
Miſs *Alice Williams*, Scotland-yard, 2d ſhare.
Miſs *Iſabel. Blackbourne*, now Mrs. *Philips*, 3d ſh.
Miſs *Sophia Burnet*, ſince Mrs. Pool, 4th ſhare.
Miſs *Martha Iſaacs*, Stanhope-ſtreet, 5th ſhare.

Compoſitions of Ornaments, after Nature, arranged according to *Fancy*, by either ſex, under 15 years. The ſubject generally taken from Prints after Baptiſt.

1758. *Andrew Durnford*, (of IIId Claſs 1757) 1ſt ſhare.
Lewis Pingo, (of 1ſt Claſs 1756) 2d ſhare.
Wm. Willis, Moorfields, Glaſs Ornam. cut. 3d ſh.

John

John Bellingham, Draftſman, Tatchf. ſtr. 4th ſh.
Thomas Vivares, Great Newport-ſtr. 5th ſhare.
Miſs *Mary Moſer*, Royal Acad. Strand, 1ſt ſh.
Miſs *Barb. Marſden*, (of 1755, 56, 57) 2d ſhare.
Miſs *Mary Chambers*, (Cl. IV. 1757) 3d ſhare.
Miſs *Eleon. Clarke*, (Cl. IV. 1757) 4th ſhare.
Miſs *Annab. Scouler*, (Siſter to J. Scouler) 5th ſh.

Drawings of a *Human Figure* or of *Heads* in Chalks, after a Print or Drawing, of a different ſize, under 14 years.

John Pye, Pupil of Major, and Landſcape En- 1760.
graver, City, *a ſitting Mars*, 1ſt ſhare.
James Ainſworth, *a Head*, *after Pars*, 2d ſhare.
Charles Whitton, *a Head*, ſuppoſed *Ganymede*, 3d ſh.
William Gaſtrell, Chaſer, Seven Dials, 4th ſhare.
Chriſtopher Finch, *an old Man's Head*, *veiled*, 5th ſh.
Thomas Callard, Pupil of Mr. Tomkins, 6th ſh.
Chriſtopher Finch, Hiſt. and Portr. Painter, abroad, 1761.
of 20 Guineas for 7 Candidates, 1ſt ſhare.
Robert Dunkarton, *a Boy's Head*, *Piazzetta*, 2d ſh.
Charles Whitton, Jeweller, abroad, 3d ſhare.
Will. Gaſtrell, Jeweller, and Watch-chaſ. 4th ſh.
William Burgeſs, Maiden-lane, Draw. Mr. 5th ſh.
James Ainſworth, Jeweller, Arund. ſtr. 6th ſhare.
Thomas Turner, Maſham-ſtr. Port. Paint. 7th ſh.
David Sands, *Head of M. Brooks*, *after Pars*, 1ſt ſh. 1762.
William Penny, Jeweller, abroad, 2d ſhare.
(No farther ſhares adjudged.)
David Sands, Upholdſter. Gr. Ruſſel-ſtreet, *a* 1763.
Cobler after Teniers, of 18 Guineas, 1ſt ſhare.
Chriſtr. Towes, St. Ann's-lane, Engraver, 2d ſh.
William Mondet, Officer in the Navy, 3d ſhare.
Robert Steele, Draftſman, in Ireland, 4th ſhare.
John Milbourne, Pupil of Mr. Cotes, Warw. ſtr.
Gold. ſquare, *a Boy's Head*, *after Piazzetta*, 5th ſh.

Richd. Hurlſtone, abroad, Portr. Painter, 6th ſh.
1764 *Rob. Steele*, Pup. of Mr. Stuart, of 16 Guin. 1ſt ſh.
William Mondet, Offic. as above, abroad, 2d ſh.
Robert Hardy, in office in the Law, 3d ſhare.
Philip Stevenard, abroad, Jeweller, 4th ſhare.
Rich. Hurlſtone, Port. Paint. Bow-ſtr. Co. Ga. 5th ſh.
John Milbourn, *Cain and Abel*, *an appn. Study*, 6th ſh.
1765. *Andr. van Rymſdyk*, aged 11 Years, Son of Mr. John van Rymſdyk, Painter of Hiſtory and other Subjects, Wych-ſtr. Dru. Lane, *Copy of the Tribute-money*, *after P. P. Rubens*, of 20 Gs. Prem. 8 Guineas.
Robert Marris, Poland-ſtr. Landſc. Paint. 5 Gs.
Rob. Montreſor, Pars Acad. Officer abroad, 4 Gs.
John Wilmot, Shoe-lane, Stucco-worker, 3 Gs.
1766. *Andries van Rymſdyk*, aged 12. *Transfiguration*, *after Raphael*, 10 Guineas.
Will. Ang. Barron, Caſtle-ſtr. Oxford-road; *two Satyrs Heads*, *after Rubens*, 6 Guineas.
James Rouby, Pupil of Mr. Zoffany, 4 Guineas.
1767. *Andr. van Rymſdyk*, a Drawing, *Converſion of St. Paul*, *after Rubens*, Bounty, a Silver Pallet gilt.
1768. Miſs *E. Addis*, Portrait Paint. Birchin-lane, *a Lady with a Cupid*, after *Sr. Joſ. Reynolds*, Bounty, a Silver Pallet.
Subject changed to *Outlines of Hum. Fig.* and Premium from pecuniary to honorary.
1769. *David Watts*, Cooper, Up. Tham. ſtr. Silv. Pall. g.
John Keyſe Sherwin, aged 13. afterw. Pupil to Bartolozzi, *the Head of a Blackmoor*, Bnty. a Silv. P.
1770. *William Smith*, Pupil of Mr. Pether, and Miniature Painter, in Scotland, a Silver Pallet gilt.
Thomas Cook, Engraver, Iſlington, Silv. Pallet.
1771. *Richard Read*, Pupil of Caldwall, a Silv. Pall. gilt.
Leonard Willemſt, Archit. abroad, a Silver Pall.
1772. *Thomas Reynolds*, Painter, Mount-ſtreet, Groſv. ſquare,

quare, *Hum. Fig. aft. Bartolozzi*, a Silv. Pall. gilt.
John Blackmore, Co. Ornam. Paint. Caſtle-ſtr. Newport-market, *an Antinous*, a Silver Pallet.
Julius Tidd, Engraver, Gray's-inn-lane, *Acteon and Dogs, after M. de Vos*, a Silver Pallet gilt. 1773.
T. N. vander Meulen, Jun. Statuary, Caſtle-ſtr. Oxford-road, *an Academy Figure*, a Silver Pallet.
Julius Tidd, *Converſion of St. Paul*, Silver Pallet. 1774.
Drawing *Hum. Fig.* or *Head*, under 14 years.
Miſs *Ann Smith*, Portland-road, Silv. Pallet gilt. 1775.
James Durand, at Mr. Craſhley's, Fig. maker, Long-acre, *from a Caſt of Hercules*, Silver Pallet.
Miſs *Ann Smith*, *Grec. Venus, from Plaſter*, Silv. Pall. 1776.
Drawings of a *Human Figure*, in Chalks, after a Print, &c. under 16 Years, general Subject, the *Farneſian Hercules*.
Richard Earlom, (Cl. I. 1757) of 15 Gs. 1ſt ſh. 1758.
William Parſons, (Cl. as above) 2d ſhare.
Johnſon Carr, (ſame Claſs) 3d ſhare.
Simon Taylor, (Cl. I. 1756) 4th ſhare.
Richard Croſs, Miniat. Paint. Henriet. ſtr. 5th ſh.
General Subject, *Bacchus*, of any Collection.
John Al Greſſe, (1755, 56, 57) *aft. Camp gl.* 1ſt ſh. 1759.
William Pars, (ſame years) *B. of Sanſovino*, 2d ſh.
Simon Taylor, (1756, &c.) the ſame, 3d ſhare.
Johnſon Carr, (1757, &c.) *B. of Mich. Angel.* 4th ſh.
Lewis Pingo, (Cl. I. 1756) the ſame, 5th ſhare.
Subjects *Optional*.
William Parſons, (as above) *Academ. Fig.* 1ſt ſh. 1760.
John Ruſſell, (of 1758) Mortim. ſtr. Cav. ſq. 2d ſh.
Samuel Ireland, *Hercules ſlaying the Hydra*, 3d ſh.
General Subjects *Academy Figures*.
Thomas Vivares, of Gr. Newport-ſtr, 1ſt ſhare. 1761.
George Robertſon, Landſcape Painter, 2d ſhare.
Hugh Barron, (of 1759) Portr. Paint. Italy, 3d ſh.
William Willis, (of 1760) King-ſtr. Moorfi. 4th ſh.

Christr. Whitton, Seal-engraver, abroad, 5th sh.
1762. *Francis Wheatley*, Pupil of Mr. Wilson, 1st sh.
John Kitchingman, Pupil of Mr. Shipley, 2d sh.
Thomas Caliard, Landsc. Painter, dead, 3d share.
James Durno, Pupil of Mr. Cassali, 4th share.
John Henderson, now an Actor of merit, 5th sh.
1763. *Francis Wheatley*, abroad, Hist. Paint. 7 Guineas.
Wm. Gastrell, since Miniat. Paint. and dead, 5 Gs.
Robert Dunkarton, a Belisarius, aft. Salv. Rosa, 3d sh.
Philip Wicksteed, Pupil of Zoffani, 4th share.
1764. *William Lewin*, St. Paul's Church-yard, 5 Guin.
Thomas Brookes, a Satyr, aft. Han. Carracio, 4 Gs.
Richard Sparrow, Engrav. Grosse's Antiq. 3d sh.
Wm. Stad. Blake, Engrav. Ab. Church-lane, 4th sh.
1765. *John Milbourn*, jun. *Acad. Fig. aft. Mortimer*, 5 Gs.
John Beauvais, of Acad. Strand, Jeweller, 3 Gs.
Charles Towes, of same Acad. Engraver, 3d sh.
David Hennel, Goldsm. Hall, Foster-lane, 4th sh.

Three or more *Human Figures grouped.*

1764. *Geo. Sykes*, Pup. of Mr. Parsons, *an Hist Draw.* 7 Gs.
David Sands, a Resurrection from a Print, 5 Guin.
Rob. Dunkarton, the Judgment of Paris, with pen and ink, *after Bouverla*, 3d share.
1765. *Thomas Brooks*, Son of Mr Brooks, Engraver, Greek-str. Soho, *a ret. from Egypt, aft. Rubens*, 5 Gs.
Wm. Rogers, grouped Fig. aft. Pars, Orn. draw. 3 Gs.
1766. *Thomas Ryder*, Engrav. Pup. of Mr. Basire, 6 Gs.
Richard Atkinson, Pupil of Mr. Elliot, Designer, *Susanna and the Elders, aft. Jean Bapt. de Troyes*, 2d sh.
Js. Roberts, Portr. Paint. Duke-str. Westm. 3d sh.
Richard Oakes, Superintend. Yard Portsm. 4th sh.
Miss *Catherine Wathen*, 2d Daught. of Dr. Wathen, aged 11 Y. *a Beagle with her Puppies*, from a French Print.

N. B. The two Miss *Wathens*, and Miss *Ann Graham*, declined accepting a Reward, being satisfied with the honour of approbation.

Human

Human Figure, naked, not leſs than 16 Inches high, after Picture, Print, or Drawing, but of a different ſize.

Charl. Reuben Riley, Engrav. Wells-ſtr. Oxford-Road, *a ſleeping Venus, St. Quintin*, a Silv. Pallet. 1767.

Auguſt. Touſſaint, Miniat. Painter, Denmark-ſtreet, *an Acad. Fig.* a Silver Pallet gilt. 1768.

Charl. Grignion, Portrait and Hiſtory Painter, *the ſcourging Man, Dominichino*, a Silver Pallet.

Robert Dighton, Miniat. Paint. Lambeth, *a fancy Head*, in pen and ink, *aft. Worledge*, a Silver Pallet.

Francis Moore, Statuary, Berner-ſtreet, *a back View of the fighting Gladiator*, a Silver Pallet. 1769.

Samuel Shelley, Miniat. Painter, *Judgment of Hercules*, Ind. Ink, *aft. Paolo de Matthei*, Silv. Pall. 1770.

Rob. Lawrie, Engrav. Fleet-ſtr. Sayre, Silv. Pall.

Henry Stubble, Portr. Paint. Caringt. ſtr. Silv. Pall.

Charl. Wilkin, at Mr. Perfect's, Wimpl. ſtreet, a Silver Pallet Gilt. 1771.

John Phillimore, Pupil of Mr. Pars, a Silv. Pall.

James Brunton, of Norwich, *Dancing Faun*, S. Pall.

Miſs *Ann Paltock*, Arlingham, Gloſterſhire, *ſome Ruins of Palmyra*, Bounty, a Silver Pallet.

John Roberton, of Woolwich Academy, ſome Ruins of Balbec. Bounty, a Silver Pallet.

Rich. Hammond, (under 15) *a Landſc.* Silv. Pall. g.

Iſaac Popplewell, Wardour-ſtr. Soho, S. Pall. g. 1772.

Henry Jouret, Maiden-lane, *Acad. Fig.* Silv. Pall.

Thomas Letton, at Mr. Picot's, Engraver, reſiding at Greenwich, a Silver Pallet gilt. 1773.

Geo. Purden, at Mr. Burges, Maiden-l. Silv. Pall.

Edward Scott, Pupil of Mr. Frederick, Gray's Inn Lane, Engraver, a Silver Pallet gilt. 1774.

John Hindmarſh, Pupil of Mr. Holloway, Miniat. Painter, *an Acad. Fig. aft. Van Loo*, a Silv. Pall.

1775. *James Hogg*, Pupil of Mr. Caldwell, Engrav. a Silver Pallet gilt.

Diana Dietz, Angel Court, Wd. mill-ſtr. Silv. Pall.

1776. *Peter Denys*, of the Charter-houſe, ſingle Claim, a Silver Pallet gilt.

Thomas Denys, Brother of Peter, Silv. Pallet gilt.

Will. Strand, Son of Jeweller, Villers-ſtr. Sil. Pall.

Original Compoſitions of Ornaments, with Beaſts, Birds, Fruit, and Flowers, after Nature, for Embroiderers, Manufacturers, &c. the general Subjects from Prints after Baptiſte; by either Sex under 18 Years.

1758. *Henry Pingo*, (Cl. III. 1756) of 15 Guin. 1ſt ſh.

William Chimney, Writ. Maſt. Gough-ſq. 2d ſh.

Fred. Miller, Engrav. Dorset Crt. Wmſtr. 3d ſh.

James Gandon, (Cl. II. 1757) Broad-ſtr. Soho, Architect, Pattern for Weavers, 4th ſhare.

Math. Stable, Ornam. Paint. gone to Ruſſia, 5th ſh.

Miſs *Hannah Chambers*, Milford-lane, 1ſt ſhare.

Miſs *Mary Pingo*, Siſter of Meſſ. Pingo, 2d ſh.

Miſs *Sarah Kirby*, now Mrs. *Trimmer*, Brentf. 3d ſh.

Miſs *Sarah Clarkſon*, oppoſ. St. Clement's Church, Strand, 4th ſhare.

Miſs *Ann Henſhaw*, near Norfolk-ſtr. Strand, 5th ſh.

1759. *William Pars*, (Cl. I. 1756) 1ſt ſhare.

Simon Taylor, (ſame Claſs) 2d ſhare.

John Bellingham, Drawing-maſter, 3d ſhare.

Mathias Stable, Pupil of Cathrine Coach Ornament Painter, 4th ſhare.

Miſs *Mary Moſer*, (Cl. und. 15, 1758) *an eleg. Noſegay*, 1ſt ſh. And for extra Merit, a Silver Medal.

Miſs *Mary Chambers*, (Cl. IV. 1757) 2d ſhare.

Miſs *Hannah Chambers* (ſee 1758) 3d ſhare.

Miſs *Mary Pingo*, (ſee 1758) 4th ſhare.

Miſs

Miſs *Hannah Ruſh*, (not 11 years) Ludgate-hill, a *Compartment with Cattle*, 5th ſhare.

Lewis Pingo, for Weavers alone, 1ſt ſhare. 1760.

John Edwards, Paint. Pupil of Maberly, 2d ſh.

William Sharpe, Engr. Pupil of Longmate, 3d ſh.

The remaining ſhares were not adjudged.

Miſs *Hannah Chambers*, (of 1758) 4 Guineas.

Miſs *Mary Chambers*, (of 1757) 3 Guineas.

Robert Chaſſereau, Carver, Monmouth-ſtr. 2 Gs. 1761.

Age leſſened under 16 Years.

Joſeph Bellingham, (Brother of John B.) 9 Guin. 1762.

Joſeph Bumfries, Chaſer, Birmingham, 6 Guin.

Miſs *Mary Fearon*, Brew-houſe, Millbank, 3 G.

Samuel Paris, Pattern-draw. Spittal-fields, 6 Gs. 1763.

John Browne, Stationer, Cheapſide, 4 Guineas.

Thom. Brooks, (Cl. 14 Years, 1762) 3 Guineas.

Miſs *Mary Fearon*, of Millbank, 5 Guineas.

Miſs *Alice Morriſon*, of Moorfields, 3 Guineas.

Miſs *Mary Fearon*, Patt. for Embroiderers, 1ſt ſh. 1764.

Miſs *Ann Sherborn*, Daught. of Engraver, Gutt. Lane, now Mrs. Scurray, 2d ſhare.

Miſs *Alice Morriſon*, (now Mrs. Hemans) for Brocade-weavers, ſingle Claim, 6 Guineas.

Miſs *Jane Brabam*, for Embroiderers, Frith-ſtr. 1765. Soho, 5 Guineas.

Miſs *Anne Watſon*, Queen's Embroid. Newport-ſtreet, 4 Guineas.

Miſs *Ann Sherborn*, Compoſ. of Ornam. 3d ſhare.

Miſs *Alice Morriſon*, for Brocades, 7 Guineas.

Miſs *Anne Pars*, Siſt. of Draw. Mr. ſingle Cl. 3 Gs. 1766.

Miſs *Anne Hewett*, with cut plates, 10 Guineas. 1769.

John Dew, Calic. Patt. Draw, Old Ford, 3 Gs. 1772.

Rob. Lawrie, (Cl. 16 Y. 1770) in part and ſing. 3 Gs. 1773.

Robert Lawrie, Mezzot. Engraver, ſingle, 5 Gs. 1775.

Robert Lawrie, as above, Spa-fields, ſingle, 10 Gs. 1776.

Com-

Compoſitions of Flowers after Nature, by Youths under 21, and Girls under 20 Years.

1759. *Nathaniel Smith*, Pup. of Roubillac, ſing. Cl. 3 Gs.
Miſs *Rach. Chambers*, Siſter of Mary and Hannah, ſingle Claim, 3 Guineas.
Simon Taylor, (ſee 1756 to 59) 6 Guineas.
Wm. Ellis, Moor-fields, Glaſs-Gra. Cutter, 2 Gs.
Miſs *Mary Vivares*, Newport-ſtr. ſingle Cl. 5 Gs.
The ſame Kind for either Sex under 20.

1760. *Henry Pingo*, (ſee 1756 to 59) of 15 Gs. 1ſt ſh.
William Hebert, Pupil of Mr. Vivares, 2d ſhare.
John Billingham (of 1759) 3d ſhare.
William Chinnery, (of 1758) 4th ſhare.

1761. *Henry Pingo*, (as above) 1ſt ſhare.
Matthias Stable (Cl. 18 Years, 1758) 2d ſhare.
William Sharpe, (Cl. 18 Years, 1759) 3d ſhare.

1762. *Wm. Woodward*, Land-ſurveyor, Holborn, 1ſt ſh.
Matthias Stable, (of 1758, 59) 2d ſhare.
Boyle Arthur, Son of an Actor, abroad, 3d ſhare.
John Taylor, Hiſt. Paint. Charlotte-ſtr. 4th ſhare.

1763. *William Woodward*, (as above) 1ſt ſhare of 22 Gs.
Francis Torond, Drawing-maſt. Wells-ſtr. 2d ſh.
Joſeph Bumfries, Chaſer, Birmingham, 3d ſhare.
Will. Sharpe, Engrav. ſee Bell's Editions, 4th ſh.

1764. *William Woodward*, Deſign for Weavers alone, 1ſt ſhare, 7 Guineas.
Samuel Paris, Pat. Draw. Spit. fields 2d ſh. 4 Gs.
John Bellingham, (as above) of 20 Guin. 1ſt ſh.
William Sharpe, Engrav. Vauxhall-turnp. 2d ſh.
John Miller, Engr. Channel-row, Weſtm. 3d ſh.

1765. *Wm. Lewin*, St. Paul's Church-yard, part 4 Gs.
Hugh Clarke, Engraver, Charing-croſs, 3 Guin.
Wm. Woodward, Pattern for Weavers, 4 Guin.
Benjam. Pingo, (youngeſt Son of Thom. P.) 3 Gs.

Samuel

Samuel Paris, Primroſe-ſtr. Biſhopgate, 14 Gs. 1766.
Benjamin Pingo, (as above) 6 Guineas.
John Edwards, Flow. Paint. Bow, Middleſ. 12 Gs. 1767.
Jn Turvin. Primroſe-ſtr. Bp. gate without, 20 Gs. 1768.
Wm. Naylor, Calic. Pat. Draw. Old Ford, Bow. 6 Gs.

The ſame Honorary, both Sexes, under 21.

Miſs *Anne Hew[illegible]* ſingle Claim, Silv. Pallet gilt. 1769.
Benjam. Pingo, (as above) Gold Pallet.
Abrah. Mondet, Pr[illegible]-ſtr. (Pupil of Batterſby) Brocade Pattern Drawer, a Silver Pallet gilt.
Richard Siffell, Broc. Patt. Draw. a Silv. Pall. gilt. 1770.
Joſeph Slater, Buckgh. ſtr. in the Navy, *an Infant* 1771. *Jeſus on a Cuſhion*, ſingle Claim, a Silver Pallet gilt.
John Edwards, Flow. Paint. as above, Gold Pall.
Wm. Peachey, Dean-ſtr. Fetter-lane, Silv. Pal. g.
Peter Sayer, Patt. Draw. Primroſe-ſtr. Silv. Pall.
John Skinner, Portr. Paint. Pupil of Mr. Gardner, 1772. ſingle Claim, Silver Pallet gilt.
John Turvin, Spital-ſquare, Miniature Painter, and Teacher, a Silver Pallet gilt.
Wm. Peachey, Watch-finiſher, abroad, Silv. Pall.

Fruit, *Flowers*, and *Plants*, by either Sex under 20 Years.

Miſs *Mary Watſon*, Siſter of Alex. Watſon, Bill. 1772. ſquare, a Silver Pallet gilt.
Miſs *Martha Iſaacs*, Bellſavage-yard, Silv. Pallet.
Miſs *Eliz. Vivares*, Gr. Newport-ſtr. Silv. Pall. g.
Prince Hoare, Portr. Paint. Bath, a Silv. Pallet.
John Philpot, Cal. Patt. Draw. Old Ford, S. Pall. g.
Miſs *Mary Watſon*, Billeter-ſquare, Silv. Pallet.
Thom. Burgeſs, Primr. ſtr. Bp. Gate, ſingle, Sil. P. g. 1773.
John Skinner, abroad in the Navy, Silv. Pall. g.
Robert Lawrie, with Sayer, Fleet-ſtreet, Silv. Pall.
Miſs *Martha Iſaacs*, as above, 5 Gs. and Silv. P. g.
Alex. Watſon, Billiter-ſq. 3 Guin. and Silv. Pall.

Miſs

1774. Miſs *Diana Dietz*, Angel-crt. Windmill. ſtr. S. Pal. g.
Joſ. Barney, Pup. of Mr. Zucchi, Adelphi, Sil. P.
1775. *Joſeph Barret*, Son of the Landſc. Paint. Gold Pal.
Miſs *Diana Dietz*, as above, a Silv. Palter gift.
1776. *Bernard Paul*, from Flanders, and returned, a Fox-dog, from the life, a Silver Palter gift.
Compoſitions of Fruit, Flowers and Plants, with or without Reptiles and Inſects, after Nature, diſtinctly from the Patterns for Manufacturers, by either Sex under 20 Years.
1761. [illegible] Gs. 1ſt ſh.
[illegible] 2d ſhare.
Miſs *Mary Pyott*, Daughr. of Engrav. 1ſt ſh.
Miſs *Mary Pingo* (of 1758, 59) 2d ſhare.
Miſs *Mary Robertſon*, [illegible] Buildings, 3d ſh.
1762. *John Edwards*, (as above) [illegible] 5 Guin.
Miſs *Mary Pingo*, (as above) 1ſt ſhare.
Miſs *Mary Ann Hamilton*, (ſince of Knightſb.) 2d ſh.
1763. *John Edwards*, Flow. Paint. (as above) 1ſt ſhare.

John Kitchingman, Hiſt. Portr. and Sea Painter, King-ſtreet, Covent Garden, 2d ſhare.

Thom. Hearne, Pup. of Woollet, Leiſt. fields, 3d ſh.

Miſs *Ann Jones*, (of 1761, 2, *Birds and Beaſts*) 5 Gs.

1764. Miſs *Mary Wathen*, Daught. of Dr. Wath. 1ſt ſh.

Miſs *Ann Jones*, Cambridge-ſtr. Carn. mkt. 2d ſh.

Miſs *Mary Brooke*, Daughter of the Rev. Mr. Brooke, Nottinghamſhire, 3d ſhare.

Miſs *Mary Chambers*, Milford-lane, Brew-houſe, White-friars, 4th ſhare.

1765. *Peter Nicol. Pithou*, Charl. ſtr. Tottenh. Court, whole Premium, 10 Guineas.

1766. *Rob. Dunkarton*, Mez. Engrav. 452, Strand, 6 Gs.

Ja. Paul Atkinſon, St. Margar. ſtr. Weſtm. 4 Gs.

Miſs *Jane Braham*, Teach. Ornam. Drawing and Embroidery, Frith-ſtreet, Soho, 4 Guineas.

Com-

Compoſitions of *Beaſts*, *Birds*, &c. from Life, or *Dead Game*, or *Still Life* after Nature, in diſplay of Invention ſuperior to the Patterns for Manufacturers; by either Sex, under 20 Years.

William Par..., (of former years) ſingle Cl. 6 Gs. 1761.
Miſs *Anne Jones*, ſingle Claim, 5 Gs. the ſame...
Miſs *Anne Jones*, ſingle Claim, 10 Guineas. 1762.
John Parker, Landſc. Paint. Stangate, Lambeth, ſingle Claim, 10 Guineas: and again the ſame
John Parker, Pup. of the Smiths, of 10 Gs. 1ſt ſh. 1763.
John Hakewill, Painter, Pupil of Mr. S. Wale, Broad-ſtreet, Carnaby Market, 2d ſhare.
Rob. Dunkarton, Mezzot. Engrav. as abov, 4 Gs. 1765.
James Lee, Paint. Caſtle-yard, Holborn, 2 Guin.
Joſeph Bell, Landſc. and Horſe Paint. High-ſtr. 1766.
Marybone, Pup. of Verduſſen and Tomkins, 4 Gs.

N. B. In this and other Claſſes, the Candidates were allowed to contend, while their Age permitted, 'till they twice obtained the firſt Premium.

Views from Nature, taken upon optional Spots, by Youths under the Age of 19 Years, to divide 20 Guineas.

John Al. Greſſe, a Farm-houſe at Carſhalton, 1759.
Surry, ſtained Drawing, 1ſt ſhare.
John Hakewill, London from Brixton Cauſeway, Chalks, 2d ſhare.
Js. Gandon, View of Paddington, ſtained, 3d ſh.
W. Pars, Lambeth from Millb. ferry, In. Ink, 4th ſh.
J. Hakewill, View fr. the Neat-h. Millb. Cha. 1ſt ſh. 1769.
* *Johnſ. Carr*, the River near Chelſea, Chalks, 2d ſh.

* This promiſing young man, at the early period of 21 years, executed Drawings equal to thoſe of the ableſt maſters then in this country. He died, much regretted, in 1764.

Jn.

Jn. Edwards, Proſpect at Tottenh. Chalks, 3d ſh.

M. A. Rooker, View of the Brill from Pancras Bowling-green, Chalks, 4th ſhare.

1761. *W. Kirby*, Kew-bridge fr. the Green, waſhed, 1ſt ſh.

Johnſ. Carr, the Thames from Sir Rd. Glynn's Water-ſteps, Chalks, 2d ſhare.

Jn. Hackewill, View of Mouſley [illegible] Chalks, 2d ſh.

A. Nelſon, Twickenham on the Water-ſide, 4th ſh.

1762. *Johnſ. Carr*, Weſtminſter Abbey from Chelſea Water-works, Chalks, 1ſt ſhare.

William Hodges, the River at Chelſea with Batterſea Steeple, Chalks, 2d ſhare.

Arth. Nelſon, View of Hampton-wick, ſtain. 2d ſh.

John Hackewill, View from the Plough on Hampſtead Heath, Coloured, 4th ſhare.

1763. *Johnſ. Carr*, the Thames from Chelſea, Chalks, of 30 Guineas, like the laſt, 1ſt ſhare.

T. Vivares, the Spring in Hyde-park Gr. ſtain. 2d ſh.

Will. Hodges, the River from Millbank, 3d ſh.

1764. *Will. Hodges*, the Severn at the Wreakin, 1ſt ſh.

Joſeph Farington, View of Kelwick, Cumberland, ſtained Drawing, 2d ſhare.

John Fougeron, Serpent. River, with the Keeper's Cottage (now in the Eaſt Indies), 3d ſhare.

1765. *J. Farington*, Chelſea fr. Batterſea Fields, Ch. 1ſt ſh.

J. Fougeron, a Proſp. from Hyde-park, Col. 2d ſh.

1766. *Joſ. Farington**, the Cheeſe-cake Houſe, Hyde-park, Chalks, 1ſt ſhare.

* The Brothers *J.* and *G. Farington*, *Rich. Earlom*, *Geo. Robertſon*, *Edw. Edwards*, *Joſias Boydell*, and other able Draughtſmen, have preſerved to the admirers of the Art by very accurate Delineations, either for Engraving, or for Mr. John Boydell's Collection, ſome of the moſt valuable pieces, in the celebrated Gallery of Pictures at Houghton, lately purchaſed and ſent abroad, with a leſs numerous but judiciouſly collected Cabinet, to enrich the extenſive aſſemblage of Paintings of a moſt magnificent Empreſs.

Franc.

Franc. Wheatley, in Ireland (ſubj. unknown), 2d ſh.
Thomas Hearne, Proſpect over the River from 1767.
Milbank, (ſingle) 1ſt ſh. See his Antiq. of Gr. Brit.
The ſame *Local Views*, and the Premium made Honorary, under 21 Years.
Geo. Garrington, the White-houſe from the Grove, 1770.
Hyde-park, Silver Pallet gilt.
Geo. Farington, the Serpentine River from Kenſington Gardens, a Silver Pallet gilt. 1771.
John Naſh Coleton, (Subject unknown) ſ. Silv. Pall.
Rich. Atkinſon, Lake of Derwentwater from 1772.
the foot of Seidaw, in Cumberland, a Gold Pall.
Jn. Skinner, View of Rocheſter Caſtle, Silv. Pall. g.
John Hakewill, a View of St. John's and Weſtm.
Abbey Church from Chelſea-road, ſm. Silv. Pall.
R. Wilkinſon, Noel-park, D. Dorſet, Kent. S. S. Pall. 1773.
Jn. Roe, View of Copenhagen-houſe, S. Silv. Pall.
Rich. Atkinſon, Cataract on the Tees, Middleton, Yorkſhire, a Gold Pallet.
R. Wilkinſon, View near Houghton, Norf. Silv. P.
J. J. Barralet, View of Brentf. from Kew, G. Pall. 1774.
Will. Aug. Barron, Proſpect on Stoke Common, Bucks. a Silv. Pallet gilt.
John Cleveley, View of a Caſtle, Iſle of Wight, ſmall Silver Pallet.
W. A. Barron, Hampton Court, and the River 1775.
at Thames Ditton. Gold Pallet.
Robert Barret, View from Weſtburn-Green toward Hampſtead, Silver Pallet gilt.
Jn. Feary, the Water-fall near Meltrop, S. Silv. P.
T. Hearne, View of Brinkworth, Wiltſh. Gold Pall. 1776.
C. Tomkins, Milbank and the River, Silv. Pall. g.

Drawing *a Horſe from the Life*, at leaſt 10 Inches high, with Chalks only, and under 20 Years.

Wm. Pars, Strand, the whole Prem. of 10 Gs. 1760.

George

1761. *George Robertson*, F. S. A. Gr. ED Age 22 Y.
1764. *Thom. Hearne*, Leicester-sq. chfield-str. 2d sh.
Christ. Finch, History Painte 15 Guin. 1st sh.
1765. *F. Miller*, Dorset-co. Chan. I deceased, 2d
Size enlarged to 12 Inch w. Westm. 3d sh.
postures in proportion. standing; other
1766. *Jn. Parish*, now in the Ordn Tower, 4 Gs.
Original *Designs* for *Cal makers, Coach-makers, Manufacturers in Metals, China*, and *Earthen-ware*, under 22 Years.
1759. *Fr. Town*, Lands. Paint. Exet of 15 Gs. 1st sh.
Henry Pingo, (of Class III. 1756) 2d share.
William Alderson, Engraver, abroad, 3d share.
Joach. Smith, Col. Portr. Model Berner-str. 4th sh.
Will. Chinnery, Writing-mast Gough-sq. 5th sh.
Designs for *Ornamental Household Furniture*.
1769. *Thomas Banks*, Statuary, Newman-str. Oxford-road, *a variety of Drawings*, 20 Guineas.
Drawings of *Human Figures*, from *Models*, *Casts in Plaster*, or *Bas-reliefs*; principal Fig. not under 12 Inches, by young Men under 18 Years.

General Subject the *Dancing Faun*.

1758. *John Smart*, (vide 1755, 56, 57) of 15 Gs. 1st sh.
Richard Cosway, (v. 1755 and 57) 2d share.
John Gresse, (v. 1755, 56, 57) 3d share.
Will. Pars, (v. 1756 and 57) 4th share.
Subject Optional: Age under 22 Years.
1759. *N. Smith*, Hercul. and Atlas, a st. Roubillac, 1st sh.
William Peters, a Gladiator dying, 2d share.
Joseph Nollekens, Faun with the Kid, 3d share.
Rich. Cosway, Fighting Gladiator, 4th share.
M. Steel, Pup. of Wilson, gone to Ireland, 5th sh.
Subject Optional: Age under 20 Years.
1760. *Wm. Lawrenson*, Biblis & Caunus, a Group, 1st sh.

Richard Earlom, Bacchus Florent. Gall, 2d ſh.
Henry Leake, Apollo, Villa Medici, 3d ſhare.
William Parry, the Dancing Faun, 4th ſhare.
William Parry, Hercules and Atlas, Group, 1ſt ſh. 1761.
William Lawrenſon, the Piping Faun, 2d ſhare.
John Bellingham, a Gladiator dying, 3d ſhare.
Wm. Parry, Sampſon ſlaying Philiſtines, 1ſt ſh. 1762.
John Parker, Cupid and Zephyr, Group, 2d ſh.
Will. Chinnery, the Wreſtlers, Group, 3d ſhare.
Jn. Bellingham, the Grecian Venus, of 20 Gs. 1ſt ſh. 1763.
Wm. Pennington, Silenus with the Inf. Bacch 2d ſh.
John Terry, the Dancing Faun, 3d ſhare.
John Parker, the little Apollo, 4th ſhare.
Simon Watts, a Crouching Venus, 5th ſhare.
Ph. Wickſted, Farn. Hercul. aft. Scheemaker, 1ſt ſh. 1764.
John Kitchingman, Venus de Medici, 2d ſhare.
John Kitchingman, the Antique Flora, 1ſt ſhare. 1765.
Hugh Barron, the Fighting Gladiator, 2d ſhare.
P. Wickſted, Tarquin & Lucret. aft. Roubill. 3d ſh.
John Kitchingman, Monum. of Handel, by Roubiliac, 1ſt ſhare. 1766.
James Durno, Sampſon ſlaying Philiſtines, 2d ſh.
Hugh Barron, the Dying Gladiator, 3d ſhare.

Theſe Drawings being done in a maſterly manner, the Premium was diſcontinued; while thoſe for the Duke of Richmond's Gallery laſted: after which they were renewed, for Drawings from any Collection of Statues or Caſts, under 18 Years of Age.

C. Reub. Ryley, the Bacchus of Sanſovino, Gold Pall. 1770.
Geo. Pinto, a Flora, after Scheemaker, Gold Pall. 1771.
George Farrington, the dancing Faun, a Silv. Pall. g.
Geo. Pinto, a Ceres, aft. Scheemaker, ſingle Cl. 5 Gs. 1772.
Tho. Reynolds, Apollo of Belvedere, B. a Silv. Pall.
Alex. Monies, Venus de Medici, B. a Silver Pall. 1776.

Drawings of *Antique Statues*, from Original Caſts, in the Duke of Richmond's Gallery, at option, large, and with Chalks, by young Men under 21 Years, to divide 25 Guineas Premium.

1759. *John Mortimer*, the Diſcobolus, 1ſt ſhare.
John Al. Greſſe, Bacchus of Sanſovino, 2d ſhare.
William Peters, Sabina of Flamingo, 3d ſhare.
Rich. Earlom, Bacchus of Sanſovino, 4th ſhare.
1760. *John Trott r*, Apollo of Belvedere, 1ſt ſhare.
Charl. Cartwright, Muſido Sacrifizio, 2d ſh.
1761. *John Al. Greſſe*, Pætus & Arria, Group, 1ſt ſh.
Richard Earlom, the ſame Group, 2d ſhare.
1762. *Richard Earlom*, the Dancing Faun, 1ſt ſhare.
John Al. Greſſe, Fighting Gladiator, 2d ſhare.
William Lawrenſon, ſame Gladiator, 3d ſhare.
1763. *Will. Parry*, Bacchus of Sanſovino, 1ſt ſhare.
Will Lawrenſon, Bacchus of Mich. Angel. 2d ſh.
1764. *William Pennington*, Venus Callipædia, 1ſt ſhare.
John Hakewell, Bacchus of Sanſovino, 2d ſhare.
Joſeph Barron, Mercury, Greek Stat. 3d ſhare.
1765. *William Pennington*, Venus de Medici, 1ſt ſhare.
James Darno, the Antinous, 2d ſhare.
John Terry, Head of Farneſe Hercules, 3d ſh.
1766. *John Terry*, the Meleager, 1ſt ſhare.
John Feary, the ſame, 2d ſhare.
1767, and 68. producing no Claims, the Premium was changed as mentioned in the preceding Section.

Drawings of *Human Figures* from living Models, at the Academy of Artiſts in St. Martin's Lane, in Chalks, by young Men under 24 Years, to divide 30 Guineas.

1759. *David Martin*, Hiſt. and Portr. Painter, 1ſt ſh.
John Mortimer, Pupil of Mr. Pine, 2d ſhare.
Will. Sherlock, Portr. Paint. and Engraver, 3d ſh.

Wil-

William Woollet, Emin. Landſc. Engraver, 4th ſh.
Richard Coſway, (firſt Candidate 1755) 1ſt ſhare. 1760.
John Mortimer, (ſee Antiq. Stat. 1759) 2d ſhare.
David Martin, as above, in London; 3d ſhare.
Chriſt. Norton, Engraver, at Rome, 4th ſhare.
John Mortimer, (become Hiſt. Painter) 1ſt ſh. 1761.
John Taylor, Hiſtory Painter, London, 2d ſhare.
David Martin, now at Edinburgh, 3d ſhare.
John Taylor, as above, Charlot. ſtr. Rath. Pl. 1ſt ſh. 1762.
John Mortimer, (ſee Hiſt. Paint. 1763, 64) 2d ſh.
Edw. Edwards, Hiſt. Painter, London, 3d ſhare.
William Pars, Hiſt. Painter, Rome, 4th ſhare.
Richard Earlom, (ſee Iſt Cl. 1757) 1ſt ſhare. 1763.
William Parry, Landſcape Painter, 1ſt ſhare. 1764.
W. Lawrenſon, Portr. and Hiſt. Paint. Lond. 2d ſh.
Johnſon Carr, became Painter, but deceaſed, 3d ſh
Richard Earlom, (ſee his Etching, 1766) 4th ſh.
Thom. Jones, Hiſt. and Landſc. Paint. Rome, 5th ſh.
Matthew Liart, Engraver, London, 6th ſhare.
W. Lawrenſon, as above, Totenh. Crt. Rd. 1ſt ſh. 1765.
William Parry, gone into Wales, 2d ſhare.
Thom. Jones, as above, at Rome, 3d ſhare.
Matt. Liart, as above, Compton-ſtr. Soho. 4th ſh.
W. Lawrenſon, as above, Totenh. Crt. Rd. 1ſt ſh. 1766.
John Berridge, Pupil of Sir Joſ Reynolds, 2 ſh.
John Berridge, now Portrait Painter, 1ſt ſhare. 1767.
Philip Reinagle, Hiſt. and Landſc. Painter, 2d ſh.
John Edwards, (Cl. II. 1757 and Hiſtorical Compoſ. 1764) a Gold Pallet. 1769.
Jn. Kitchingman, Hiſt. and Port. Paint. Gold Pall. 1770.
John Clarke, then John-ſtr. Berkl ſq. Silv. Pall.

DRAWINGS IN ARCHITECTURE: An outſide Form adapted to the Church of *St. Stephen Walbrook*; with Plans, Elevations, and Sections: and its preſent inſide, by young Men under 25 Years.

1761. *Thomas Higgens*, (of Greeuwich) Pup. of .... the whole Premium of 20 Guineas.

——— Deſigns of a *Temple of Fame*; in antique Style, with Baſreliefs, Trophies, and Tablets for Inſcriptions; with the Plan, Elevation, and Sections; by Perſons under 30 Years: to divide 30 Guineas.

1762. *Edw. Stevens*, Pupil of Sir Wm. Chambers, 1ſt ſh.
James Gandon, Pupil of the ſame.... 2d ſhare.

——— Deſigns of a *London Houſe and Offices*, for a Perſon of Quality, 125 Feet Front, by 300 Feet Depth; in the Palladian Style, with Plan, Elevation, Sections, &c. by Perſons under 30 Years.

1763. *Edw. Stevens*, Architect, deceaſed at Rome, 1ſt ſh.
James Gandon, Archit. Editor of the Supplement to Vitruv. Brit 2d ſhare.
Thomas Cooley, Pupil of Mr. Milne, 3d ſhare.

——— Drawings of the *Banqueting Houſe*, by Inigo Jones: a Plan, Elevation, and Section, from actual Meaſurement, by Youths under 18 Years.

1763. *John Plaw*, Architect, and Maſter Builder, Weſtminſter, whole Premium of 20 Guineas.

——— Deſigns of a *Country-houſe, and Offices*, for a Perſon of Quality, on an Eminence, with Proſpects on three ſides; decorated in the Palladian Style, with Front Elevations, longitudinal and tranſverſe Sections, and Plans of the different Stories, by Perſons under 30 Years; to divide 60 Guineas.

1764. *James Gandon*, Editor of Var. Archit. Deſigns in *aquatinta*, 1ſt ſhare (half).
Thom. Cooley, Archit. Conſtr. Dublin Exc. 2d ſh.

Rob.

Rob. Baldwin, Pupil of M. Brettingham, 3d ſhare.

Drawings of *York-buildings Water-gate*, by Inigo Jones; with a Plan, Elevation, and Section, from actual Meaſurement: by Youths under 18 Years; to divide 20 Guineas.

James Pollard, Pupil of Peckford, at Derby, 1ſt ſh. 1764
Rich. Edwin, Pupil of Brettingham, dead, 2d ſh.
T. Sutton, Pup. of Le Roux, profeſſ. in Lond. 3d ſh.

Delineations of the *Portico of St. George's Church, Hanover-ſquare*; from actual Meaſurement; &c. the Age as above.

Js. Pollard, Builder, profeſſ. in Derbyſhire, 1ſt ſh. 1765.
Andr. Thornthwaite, Pup. of B. Manwaring, 2d ſh.

Elevation of the *Side of a Street*, after the Greek or Roman Style; with Plans, Sections, &c. by Perſons under 30 Years; to divide 50 Guineas.

George Richardſon, Archit. Editor of Iconology, 1765.
and other Works, 1ſt ſhare.
T. Cooley, Deſigner of Public Builds. in Irel. 2d ſh.
Rob. Baldwin, Archit. profeſſ. in London, 3d ſh.

The End propoſed in this Claſs, being fully obtained: the following Performances were rewarded with Bounties.

A Drawing of the Ruins of Palmyra, Miſs 1771.
Anne Paliock, of Arlington, a Silver Pallet.

A Drawing of the Academy at Woolwich, *John Robartſon*, Scholar there, a Silver Pallet.

A Drawing of an ornamented Mantlepiece of a 1773.
Chimney, *Nath. Wallis*, Gray's Build. Oxf. Rd. 5 Gs.

A Drawing of Ruins, *Rob. Hodgkinſon*, a Silv. Pall. 1776.

Perſpective Drawings of Machines, in the Society's Repoſitory, by Youths under 21 Y.

Thomas Malton, Jun. Poland-ſtreet, Mr. *Coulthard's Tide-mill*, 10 Guineas. 1774.

1775. *William Malton*, Brother to Thomas, Mr. *Dingley* and *Stanfield's Saw-mill*, 10 Guineas.

1776. *Js. Hunter*, the Mill for grinding Glaſs, &c. 5 Gs.

HISTORICAL DRAWINGS, the Subject from the Greek or Roman Hiſtory; *Original Compoſitions*, of five or more Human Figures, the principal not leſs than eight Inches high; made under the Age of 25 Years; to divide 30 Guineas.

1764. *John Donaldſon*, Hiſt. Painter, *Alexander near the Tent of Darius*, and *Siſigambis mourning over the Corps of Statira*, 1ſt Premium.

The Drawing on Vellum, highly finiſhed, in the poſſeſſion of Earl Buchan.

John Edwards, Flower Painter, Bow, Middleſex, *the Death of Epaminondas*, 2d Premium.

1765. *Richard Earlom*, Mezzot. Engraver, Spafields, Clerkenwell, *Numa Pompilius refuſing the Roman Sovereignty*, 15 Guineas.

1766. *William Parry*, Portrait Painter, going to Rome, *the Death of Cleopatra*, 15 Guineas.

The Advertiſement of this Premium was omitted for two years, and then continued for honorary Rewards.

1770. *Edward Edwards*, Bacchus and Ariadne, in Chalks, the Gold Pallet.

1771. *Thomas Burgeſs* *, Earl Warwick ſwearing Allegiance to King Edward, a Silver Pallet.

1772. *John Keyſe Sherwin*, Coriolanus leaving Rome upon his Baniſhment, 50 Guineas.

1774. *James Jeffereys*, Hiſt. Painter, Maidſtone, the Deluge, a Gold Pallet.

1776. *William Martin*, Pupil of Cipriani, the Judgment of Paris, a gold Pallet.

* Mr. *Burgeſs*'s Academy in Maiden-lane, produced many able Claimants for the Society's Rewards.

HO-

HONORARY PREMIUMS.

DRAWINGS *of any kind*, by young Gentlemen, or Ladies, under the Age of 16 Years; and the like Performances by young *Perſons* of *Rank* and *Diſtinction*, under the Age of 20 Years; the beſt to obtain a Gold Medal, and the next in Merit a Silver Medal.

The Hon. Lady *Louiſa Auguſta Greville*, Siſter of the Earl of Warwick, the Drawing of *a View of the Priory of Warwick*, in Indian Ink, the firſt honorary Gold Medal. 1758.

The ſame Hon. young Lady, a Drawing of the *Ruins of Netley Abbey*, the Gold Medal. 1759.

Miſs *Elizabeth Oſborn*, *a Fancy Landſcape*; compoſed and painted in oil colours by her (a Copy of which will be found executed by her in Etching); the Gold Medal.

Lady *Elizabeth Somerſet*, *a Landſcape in Colours*, an original Compoſition; the Gold Medal.

John Turner, Eſq. ſince Capt. in the Guards, and deceaſed, *a Landſcape* or *View after Nature*; the ſame Medal in Silver.

Miſs *Clayborn Coſley*, Daughter of the then Lieut. Governor of Chelſea Hoſpital, *a View of the North Parade at Bath* (a Copy of which is among the Etchings); the Gold Medal.

Lady *Louiſa Auguſta Greville*, a coloured Drawing of *Figures kneeling*, *after Guercino*; the Gold Medal. 1760.

Miſs *Maria Hoare*, of Bath, a coloured Drawing, *Moſes found in the Bulruſhes*: a preſent from her to the Society; the Gold Medal.

Miſs *Moore*, now Mrs. Henry Watſon, Rathbone-place, *a Landſcape*, *her own Compoſition*, in Biſtre, the Silver Medal.

Jeremiah Meyer, Eſq. then a riſing Artiſt, invited 1761.

to concur in producing the beſt *Profile likeneſs*, from memory, *of His preſent Majeſty*, to be uſed in cutting a Die for the Coin; obtained the Gold Medal.

From cauſes unknown, the Die engraved after this ſtriking likeneſs, was not uſed; but the young Artiſt acquiring Reputation by eminence of talents in his line, was honoured with the title of *Miniature Painter to the King*; beſides which place, he holds the rank of *Academician* in the Inſtitution under Royal Protection in Somerſet-houſe.

Theſe honorary Offers to young Perſons of Diſtinction, conſidered as permanent Premiums, were inadvertently omitted in the Years 1760, 1761, and 1767, during which time they were looked upon as diſcontinued, and although afterwards renewed to the preſent time (1776), they have produced only the following Claims.

1771. The Hon. Miſs *Maria Nugent*, Daughter of Lord Clare, *a fancy Landſcape*, in ſtained Drawing, the Silver Medal.

1772. The ſame, now Rt. Hon. Lady *Temple*, another fancy Lanſcape, ſtained, the Gold Medal.

1774. The Hon. Miſs *Harriet Boyle*, (now Mrs. O'Neale) a Drawing in Crayons of *Xenocrates and Phryne*, the Gold Medal.

Miſs *Harriet Worſley*, Gr. Daughter of the Earl of Corke, a Drawing of *a Landſcape*, in Indian Ink, the Silver Medal.

1775. The ſame Lady, a ſtained Drawing, *a View of Chepſtow Caſtle*, the Gold Medal.

1776. The Hon. Miſs *Ariana Egerton*, Daughter of Colonel *Egerton*, the *Portrait of a Relation*, in Oil Colours, the Gold Medal.

William Maſon, Eſq. *a Drawing of a Horſe*, the Silver Medal.

ETCH-

ETCHING, Encouraged as an intermediate Branch between Drawing and Engraving.

The Hon. Lady *L. A. Greville*, produced an etched Copy of a Drawing ſhe had preſented; *a Landſcape after Salvator Roſa*, to which was adjudged the Gold Medal. 1759.

Miſs *Elizabeth Oſborn*, reduced and etched a Compoſition of her own *Landſcape*, recorded among the hon. Drawings that obtained the Gold Medal.

It is probable, this ingenious young Perſon would have ſhone in contention for farther honours in the Arts, had not the thread of her life been prematurely cut off.

Among the etched Productions, admitted *of any kind*, the following were approved:

Simon Taylor, of Queen-ſt.. Golden-ſq. a ſmall *Landſcape with Cattle*, and a ſmall *whole length Huſſar*, after Worledge, done under 17 Years of Age, 5 Guineas.

Prints of *Landſcapes with Figures*, etched after Viſſcher, but of a different ſize, and under the Age of 18 Years; to divide 10 and 15 Guin. and under 21 Years, 20 Guin.

Th. Vivares, Son of Engrav. Gr. Newport-ſtr. 1ſt ſh. 1760.

William Kirby, Son of Archit. and Profeſſ. of Perſpective to His Majeſty, 2d ſhare.

The Age under 21 Years, and the Premium enlarged to 25 Guineas.

Henry Bryer, late Partner of Mr. Ryland, Engraver to His Majeſty, 1ſt ſhare. 1762.

Th. Vivares, as above, (3d ſh. not adjudged) 2d ſh.

Thom. Bonner, Engrav. Pup. of Mr. Roberts, 1ſt ſh. 1763.

James Record, Engrav. Pup. of Mr. Baſire, 2d ſh.

Miſs *Mary Vivares*, Siſter to Th. Vivares, 3d ſh.

James Record, Engraver and Delin. of Profile Portraits, 1ſt ſhare. 1764.

Fr.

Fr. Torona, Draw. Mr. and Delin. of Profiles, 2d ſh.
René Rogier, Draughtſm. of Landſcap. 3d ſhare.
W. Humphreys, Mezz. Engrav. Temple Bar, 4th ſh.
1765. *Henry Green*, Pup of Roberts, but deceaſed, 1ſt ſh.
T. Hearne, Deſign. Ruins and Landſc. Leiſt. ſq. 2d ſh.
Barnab. Mayor, Landſc. Painter, deceaſed, 3d ſh.
Kevcn. Skinner, Paint. Cecil-court, Strand, 4th ſh.
1766. *R. Stubbs*, Relat. of celebr. Horſe Paint. ſing. 1ſt ſh.

——— *Hiſtory Pieces* from Pictures or Drawings, but of a different ſize, at leaſt three Human Fig. the Principal not leſs than 8 Inches, under the Age of 28 Years; to divide 35 Gs.

Rich. Earlom, Engraver, Venus and Adonis, after Pouſſin, 1ſt ſhare.
Th. Vivares, Aſcenſ. of V. Mary, aft. S. Vouet, 2d ſh.
1767. *M. V. Buſcarlet*, Landſc. aft. Van Berghem, 1ſt ſh.

——— ENGRAVING ON COPPER PLATES, from Hiſtorical Pictures not copied before; three Human Fig. at leaſt, the principal not under 8 Inches, of ſize different from Originals: for 40 and 25 Guineas, without Age; 20 and 15 Guineas, under 24 Years.

1760. *William Sherlock*, Miniat. Paint. and Engraver, Chelſea, aged 22 Years, David and Bathſheba, own Compoſition, 20 Guineas.
1761. *S. F. Ravenet*, native of France, Gonhilda, after Caſali, the whole Premium.

——— A ſingle Figure, not under 12 Inches; for 20 Guineas.

John Hall, Andromeda, after Guido, full Prem.
1762. *S. F. Ravenet*, emin. Engraver, Lucretia, after Caſali, 40 Guineas.
1763. *Henry Bryer*, (ſee Etching) Bacchus and Ariadne, B. Luti, 20 Guineas.

S. F.

S. F. Ravenet, (ſince dead) Sophoniſba from Luca Giordano, 40 Guineas. 1764.

F. Aliamet, Surrender of Calais, after Pine, 25 Gs.

Henry Bryer, ſince dead, Mars and Venus after Vander Gucht, 20 Guineas.

T. Vivares, a Landſc. with Fig. aft. Wynantz, 25 Gs.

Wm. Byrne, the Villa Madama, after Wilſon, 25 Gs. 1765.

Thom. Vivares, a Landſcape, after Both, 15 Gs.

Th. Chambars, a Concert, after Caravaggio, 40 Gs.

Franc. Aliamet, a Circumciſion, aft. Guido, 25 Gs.

Thomas Chambars, reſiding in France, a Spaniſh Collation, after Van Harp, 40 Guineas. 1766.

John Miller, Botanic Deſigner and Engraver, Continence of Scipio, after Van Dyck, 25 Guineas.

Matt. Liart, Engraver, Agreement between Jacob and Laban, after Pietro de Cortona, ſingle Claim, 20 Guineas.

The object of Engraving being compaſſed to ſatisfaction, the Premium was changed to Compoſition, Drawing, and Engraving, by the ſame hand.

John Boydell, Engraver and Print-ſeller, Cheapſide, *for Encouraging the Art of Engraving*, exemplified in a Collection of two large Volumes of Prints, executed by the moſt eminent Artiſts in this Country, and preſented to the Society, was rewarded with the Gold Medal. 1773.

John Keyſe Sherwin, become profeſſed Engraver, produced a Compoſition invented and executed by himſelf, being a large Vignette, repreſenting in Allegorical attributes, *the Inſtitution and Progreſs of the Purpoſes of the Society*, for which his recompence was 20 Guineas. 1774.

The ſame *J. K. Sherwin*, inventing and executing a *Frontiſpiece* to the Play called *Taming the Shrew*, in Bell's Edit. of Shakſpeare, Vol. 6, was gratified with 20 Guineas. 1775.

Cut-

CUTTING ON WOOD, Groupes of Hum. Figures, Animals, Ornaments, &c.

1764. *Simon Watts*, an Aſſumption of V. Mary, after L. Cambiazzi, 15 Guineas.

James Deacon, a Pix for an Altar, 10 Guineas.

Diagrams, Allegorical Vignettes, on Wood, and Type-metal.

1775. *Thomas Bewick*, at Newcaſtle on Tyne, 7 Gs.
Will. Coleman, then Warwick-lane, London, 7 Gs.
T. Hodgſon, Geo. Crt. St. John's-ſtr. and Gate, 6 Gs.

1776. *W. Coleman*, now St. Ann's-lane, Foſter-lane, 20 Gs.

ENGRAVING DIES FOR MEDALS, the ſize of an Engliſh Crown-piece; 30 and 20 Guineas for the 1ſt and 2d beſt; unlimited as to Age: 20 and 15 Guineas, under 23 Years: and all ariſing Profits to be for the Candidate.

1758. *Thomas Pingo*, Engraver to the Mint, cut the Dies for the *Honorary Medal of the Society*, from a Deſign made by Mr. *James Stuart*, one of the firſt Members, an eſteemed Painter, and learned Architect, upon whom, for that Service, was beſtowed one of the Gold Medals from thoſe Dies; for which Mr. Pingo received the agreed Price of 80 Guineas.

1759. *John Pingo*, eldeſt Son of Thom. Pingo, a Medal on *the taking of Goree*, 1758. Deſigned, like moſt of the following, by the ſame able hand as the above; 20 Guineas.

1760. *John Pingo*, as above, *Quebec taken*, 1759. 20 Gs.

1761. *Lewis Pingo*, (Broth. to John) *Canada ſubdued*, 1760. 20 Guineas.

1762. *John Kirk*, Seal Engraver, *Hawke's Victory off Belliſle*, 1759. 17 Guineas.

John

John Pingo, the Mother of the Arts imploring Royal Protection for her Children, *Painting*, *Sculpture*, *and Architecture*, the whole Premium under 23 Years, 15 Guineas.

John Kirk, engraved, by particular Agreement, the Seal for the Society's Letters, after a Design of *Cipriani*, and a Model of *Spang*, for which he had 30 Guineas. 1762.

John Kirk, (since dead) *Conqueſt of Canada completed*, 1ſt Premium, 30 Guineas. 1763.

John Pingo, the Battle of *Minden*, 1759. 2d Premium, 20 Guineas.

L. Pingo, the Conqueſt of *Guadaloupe*, 1759, 30 Gs. 1764.

Jn. Pingo, the Victory at Plaſſey, E. I. 1758. 30 Gs. 1765.

An Honorary Pallet, to be beſtowed as a token of acknowledged Merit, inſtead of a pecuniary Reward, being modelled from a Deſign procured by *Alex. Kellet*, Eſq. the Dies were cut by *M. Jones*, of Birmingham, under the Direction of Mr. *Johnſton*, Seal-engraver, May's Buildings, London. 1767.

A *Pallet*, leſs in ſize, but in other reſpects ſimilar to the foregoing, was executed ſoon after, to be given for a ſecondary Degree of Merit, in a regular diſtribution of Rewards.

MEZZOTINTOS, *from any Picture of which there is no Print*; by either Sex, under 25 Years; Prem. 15 to 10 Guin. according to ſize: *a ſingle Head*, under 22 Years, from 10 to 4 Guineas, in proportion of Merit.

W. Pether, a Head of Dr. Knipe, aft. Kneller, 6 Gs. 1760.

Jn. Spilſbury, a Head of Mr. Locke, aft. Smith, 4 Gs. 1761.

John Spilſbury, Portrait of a Lady, after Sir Joſh. Reynolds, 15 Guineas. 1762.

Wm. Pether, Portr. of Leveridge, after Fry, 10 G.

John Spilſbury, Earl of Carliſle, whole length, after Sir Joſh. Reynolds, 15 Guineas. 1763.

1765. *William Humphreys*, the young Student, after R. E. Pine, 10 Guineas.

Sam. Okey, Portr. of Miſs Benſon, aft. Pine, 10 Gs.

1766. *William Humphreys*, a Dutch Burgomaſter, after Rembrandt, 15 Guineas.

Miſs *Alvares*, now Mrs. *Buſcarlet*, a Boy, Candle-light, after Zoffani, 6 Guineas.

1767. *Rob. Dunkarton*, Portrait of Dr. Chandler, after Chamberlain, 12 Guineas.

Will. Dickenſon, K. George II. whole length, after Pine, 8 Guineas.

Samuel Okey, an old Man reading, after Sir J. Reynolds, 5 Guineas.

Andries van Rymſdyk, a dead Chriſt, after Sir A. Van Dyck, a well executed Piece, dedicated, by permiſſion, to the Society, out of gratitude and reſpect, by the young Artiſt.

1773. *John Finlayſon*, executed with Conſent of the Society, and for his own Emolument, a Plate from the whole length *Portrait of Lord Romney*, by Sir Joſh. Reynolds, in the great Meeting-room; and for the approved Performance, was gratified with a Bounty of 30 Guineas, beſides the Preſent of a Gold Pallet*.

1776. *Robert Laurie*, invented a Method of Engraving Mezzotintos to render them more fit to be printed

* This Plate being purchaſed from the Engraver's Widow, afforded to every Member, a Portrait of their Noble and highly reſpected Preſident, by the voluntary aſſiſtance of *Valentine Green*, Eſq. Roy. Aſſoc. who ſupported it thro' that uncommon number of impreſſions. This general and generous ſervice, with a former attempt of his, to perpetuate the memory of the Society's ſucceſſes in the particular department of Painting (mentioned in the Preface), were duly acknowledged, by an unanimous vote, that gave him *the Gold Medal* with a ſuitable Inſcription.

in

in Colours; for proving and diſcloſing of which, he received a Bounty of 30 Guineas.

PAINTING IN OIL COLOURS, *Original Hiſtorical Pictures*; the Subject taken from the Britiſh or Iriſh Hiſtory; containing not leſs than three Human Figures as large as Life: without limitation of Age; the beſt to have 100 Guin. the ſecond 50 Guineas, the third 20 Guineas, or in proportion to Merit.

Robert Edge Pine, the Surrender of Calais to Edward III. 100 Gunineas. 1760.

Chev. *Andrea Caſali*, the Aſſaſſination of Edward the Martyr, 50 Guineas.

The ſame Chev. *Caſali*, K. Stephen, brought Priſoner to Empreſs Matilda, 100 Guineas. 1761.

The Chev. *Caſali*, again, Gonhilda's Honour vindicated, 100 Guineas. 1762.

R. E. Pine, K. Canute rebuking his Courtiers for Flattery, 100 Guineas. 1763.

John Mortimer, Edward the Confeſſor taking his Mother's Treaſures, 50 Guineas.

George Romney, the Death of Gen. Wolfe, 20 Gs.

John Mortimer *, St. Paul preaching to the Britons †, 100 Guineas. 1764.

* Mr. *Mortimer*, happy in expreſſing his own rapid, but natural and juſt conceptions, was alſo ſucceſsful in imitating the ſtyle of older Painters, ſome of whoſe valuable performances are preſerved in engravings executed from his delineations. Thoſe and other Talents united in his very valuable Compoſition, make the early loſs of ſo uncommon an Artiſt much lamented.

† In the Church of High Wickham, in Buckinghamſhire, this laſt Picture is placed as an Altar-piece, at the foot of which the body of the Artiſt is interred.

Ma-

Mſon Chamberlin, Eſq. R. A. King Alfred at the Cottager's, 50 Guineas.

William Pars, Caractacus brought before Emp. Claudius, 20 Guineas.

1765. *H. D. Hamilton*, Boadicea and her Daughters in Diſtreſs, 60 Guineas.

G. Romney, the Death of Edmund the First, 50 Gs.

1768. *Peter Falconet*, Son of the Statuary, Queen Eleanor ſucking Edward's poiſoned Wound, 25 Guineas.

1769. *H. D. Hamilton*, Ruffians entering the Priſon to Cordelia.

1770. *James Durno*, Margaret of Anjou with the Prince in the Wood, aſſailed by the Robbers, 30 Guineas.

1773. The ſame *J. Durno*, the K. of Cyprus brought Priſoner to Richard I. 100 Guineas.

——— In CHIARO-OSCURO, *Original Hiſtorical Pictures*, the Subject from the Greek or Roman Hiſtory; with five or more Figures; the principal not leſs than 15 Inches: Candidates Age under 28 Years: Premium 25 and 15 Guineas.

1764. *H. D. Hamilton*, Priam and Hecuba lamenting over the Corpſe of Hector, part of the 1ſt Prem.

Edward Edwards, the Death of Tatius Collegue of Romulus, part of 2d Premium.

1765. *Edward Edwards*, again, the Rape of the Sabines, 15 Guineas.

——— The ſize of the Figures enlarged to 30 Inches, and the Reward doubled.

1766. Chevalier *Andrea Caſali*, Lucretia relating Tarquin's Violence, 50 Guineas.

Peter Falconet, (at Paris) a Plot to poiſon, diſcovered, proved, and puniſhed, 25 Guineas.

ORI-

ORIGINAL LANDSCAPES *in Oil Colours*, the Candidates own Compoſition, without limitation of Age; on Canvas, firſt of 4½ by 3 Feet, ; afterwards of 6½ by 4½ Feet.

George Smith, one of the celebrated Chicheſter Brothers, firſt Premium 50 Guineas. 1760.

Jn. Smith, another of the Brothers, 2d Prem. 25 Gs.

Theſe maſterly pieces were ſoon after engraved by Mr. Woollet, for Mr. Boydell.

George Smith, the ſecond Broth. again, 50 Guin. 1761.

John Smith, the eldeſt Brother, 2d Prem. 25 Gs.

John Smith, the ſame, 1ſt Prem. 50 Guineas. 1762.

W. Tomkins, Landſc. and dead Game Paint. 25 Gs.

George Smith, as above, 1ſt Prem. 50 Guineas. 1763.

Charles Steuart, Landſcape Painter, London, 2d Premium, 25 Guineas.

Antony Devis, Landſc. Painter, Lamb's Conduit-ſtreet, 3d Premium, 10 Guineas.

George Barrett, Landſcape Painter, Orchard-ſtreet, Portm. Square, 1ſt Prem. 50 Guineas. 1764.

D. Bond, Landſc. and Flower Paint. 2d Pr. 25 Gs.

Charles Steuart, as above, Vine-ſtreet, Piccad. 3d Premium, 10 Guineas.

Daniel Bond, as above, at Birmingh. 1ſt Pr. 50 Gs. 1765.

Herb. Pugh, Landſc. and low hum. Paint. dead, 2d Prem. 25 Guineas.

Hugh Prim. Dean, Landſc. Paint. Str. 3d Pr. 10 Gs.

Thom. Jones, Hiſt. and Landſc. Painter, 50 Gs. 1767.

Rev. *John Gardner*, Landſc and Portr. Painter, Batterſea, 25 Guineas.

Nicholas Dabl, Landſcape Painter, Great Newport ſtreet, dead, 30 Guineas. 1768.

Thom. Jones, F. S. A. as above, at Rome, 25 Gs.

Edmund Garvey, Landſcape Painter, Bow-ſtr. Covent Garden, 20 Guineas. 1769.

John Al. Greſſe, Drawing-maſter, Stephen-ſtreet, Rathbone-place, 10 Guineas.

1770. *James Lambert*, Landſcape Painter, Lewes in Suſſex, 25 Guineas.

1771. *Edm. Garvey*, of Bath, gone to Swiſſerland, 20 Gs.

—— ORIGINAL SEA-PIECES, *in Oil Colours*, the Candidates own Compoſition; on Canvas, firſt of $4\frac{1}{2}$ by 3 Feet, afterwards of $5\frac{1}{2}$ by $3\frac{1}{2}$ Feet; no Age limited: Prem. from 50 to 15 Guineas, according to merit.

1764. *Richard Wright*, Craven-ſtreet, Strand, 30 Gs.
Fr. Swaine, Strct. Ground, Weſtm. dead, 15 Gs.

1765. *Robert Wilkins*, Red Lion-ſtr. Holborn, 30 Gs.
Franc. Swaine Ward, gone to the Eaſt Indies, 20 Gs.
John Cleveley, Deptford, a Storm upon the Princeſs of Brunſwick's paſſage to Holland, 10 Guin.

1766. *Richard Wright*, excell. Ship Painter, (for the larger ſize) 50 Guineas.
Thom Mitchell, Ship Paint. Chatham, Kent, 25 Gs.
Rob. Wilkins, Ship and Landſc. Paint. 10 Guin.

1768. *Richard Wright*, of Pimlico, ſince dead, the famous *Fiſhery*, engraved by Woollet, 50 Guins.

—— HISTORICAL PAINTING *in Enamel*; a Compoſition of three Human Figures at leaſt, on a Plate not leſs than 3 Inches by $2\frac{1}{2}$; Prem. from 30 to 10 Guineas.

1764. *John Finlayſon*, Mezzotinto Engraver, dead, Venus attiring by her Attendants, 15 Guineas.

1765. *Charl. Handaſyde*, The Thunder Storm in Thompſon's Seaſons, 10 Guin.

1768. *John Donaldſon*, now Miniat. Paint. Edinburgh, Hero and Leander, from Muſæus, 20 Guineas.
Charl. Handaſyde, ingen. Artiſt at Newcaſtle, M. Curtius devoting himſelf for his Country, 15 Gs.
John Donaldſon, the Death of Dido, 30 Guineas.

MODELS

MODELS of MEDALLIONS *in Wax*, &c. three inches in Diameter, under the Age of 22 Years.

Joachim Smith, untaught Deſigner and Modeller, *Alfred the Great*, and Union of the Heptarchy, 10 Gs. 1758.

Michael Spang, the Seal of the Society uſed for Letters, firſt deſigned by *Cipriani*, emblematically repreſenting the purpoſes of the Society's Inſtitution, afterwards engraved by *John Kirk*, 30 Guin.

George Mich. Moſer, Eſq. Keeper of the Royal Academy, Strand, a Model chaſed in Gold, of an Honorary Medal propoſed by him to the Society, and highly finiſhed, 30 Guineas.

Lewis Pingo, K. John delivers *Magna Charta* to the Barons, 1245, 10 Guineas. 1759.

The ſame *L. Pingo*, Louiſb. taken, 1758, 10 Gs. 1760.

Joachim Smith, the above Young Modeller, diligently improving his talent, invented a Compoſition, in which the Colours being mixed up to the various tints and ſhades of the human features, was rendered fit, from the fine texture and intimate commixtion of the ingredients, to model Portraits in Miniature, to a degree of delicacy. Deſirous to diſplay his art, he got leave to take (in a ſize ſomewhat larger than theſe Medallions) the likeneſs of a Member of the Society, Mr. *Colepeper*, and that gentleman, pleaſed with the ſtriking reſemblance, produced the work in its progreſſive ſtages, together with the ſpecimens of the materials uſed; theſe were generally allowed to have ſo much merit, as to be entitled to a mark of commendation, which was readily given by a bounty of 10 Guineas.

This invention has ever ſince ſtood unrivalled and approved, bearing the teſt of time without any change whatever; and is now carried on in an improved practice by the Diſcoverer, in Berner-ſtreet, near Middleſex Hoſpital.

1763. *John Taylor*, Apprent. to M. Milxan, Jeweller; *N. America* offering its Product to Britannia as Protectress [illegible] Guineas.

1764. The same *J. Taylor*, Jeweller at Bath, *Asia with Attributes* offering its Product to Britannia, as Protectress [illegible] Guineas.

1770. *Lewis Pingo*, a Buſt of his preſent Majeſty, and Britannia with her Attributes, a Gilt Pallet.

1771. *Lewis Pingo*, again, Victory off Cape Lagos, Boſcawen, 1759, Gold Pallet.

1772. The ſame *L. Pingo*, Engraver to the Mint, Surrender of the Havannah, 1762, Gold Pallet.

MODELLING ORNAMENTS *in Wax*, own invention, by either Sex, under 19 Years.

1758. *William Pars*, a Compoſition, with Cattle in a Landſcape, 5 Guineas.

1759. The ſame *W. Pars*, Flowers in Feſtoons, to ornament rooms, 3 Guineas.

Albert Pars, his Broth. the like Subject, 2 Guin.

1762. *Joſeph Moſer*, Neph. of the R. Acad. Keeper, *Dog ſeizing a Duck*, 7 Guineas.

1763. The ſame *J. Moſer*, Allegory, *Hawke's Victory over the French Fleet*, 12 Guineas.

Miſs *Mary A. Hamilton*, Flow. & Fol. feſt. 5 Gs.

Miſs *Mary Robinſon*, a ſimilar Compoſition, 3 Gs.

1764. Miſs *M. Robinſon*, ſimilar ſubject, 6 Guin.

Albert Pars, a Group *of Horſes in Landſc.* 10 Gs.

The ſame Performances extended to 21 Years for either Sex.

1765. *Albert Pars*, again, a groupe of *Cows in Landſcape*, 8 Guineas.

Joſeph Moſer, a young Hercules, *ſtem of a Candleſtick*, 4 Guineas.

Richard Benſon, a Group of Flowers, 3 Guineas.

1774. *John Cha. Lochée*, Model of a Chandelier, 7 Gs.

1775. *N. Gouron*, Model of the ſame kind, 5 Guineas.

MODEL-

MODELLING BAS RELIEF ORNAMENTS *in Clay*, Flowers and Foliage for Feſtoons, under 19 Years; Birds and Beaſts, for Friezes and Tablets, under 22 Years, to divide 10, 12, and 15 Guineas.

George Dieterich, Apprent. to Cheere, Feſtoons, half of the Premium. 1758.

William Sheffield, Apprent. to Wildſmith. for Tablets, two thirds of the Premium. 1759.

Will. Hodges, ſince Pup. of Willon, Feſt. ½ ſh.

Nathan. Smith, Ap. of Roubillac, Tab. 1ſt. Prem. 1760.

Geo. Parbury, Pup. of R. Acad. Keep. Moſer, 2d ſh.

John Daintry, Apprent. of Carter 3d. ſhare.

John Scott, Ap. of Cuenot, ſen. Feſtoons, 1ſt ſh.

Philip Regnart, taught by his Father, 2d ſhare.

John Daintry, ornam. Carv. Lond. Tab. 1ſt ſh. 1761.

Geo. Parbury, M. Chaſer, Iſlington. 2d ſhare.

John Scott, as above, Feſtoons, 1ſt ſhare.

Philip Regnart, as above, —— 2d ſhare.

John Scott, as above, Tablets, 1ſt ſhare.

George George, Apprent. of Wildſmith, 2d ſhare. 1762.

John Bernard, taught by his Father, 3d ſhare.

John Cuenot, taught by his Father, Feſt. 1ſt ſhare.

John Carter, Apprent. to Cheere, 2d ſhare.

John Earley, now at Datchet, Windſor, 3d ſhare.

Geo. George, Ap. Carver, as above, Tab. 1ſt. ſh. 1763.

John Scott, Apprent. Carver, as above, 2d ſhare.

Phil. Regnart, Ap. Carver, as above, 3d ſhare.

John Cuenot, Carver, ſince dead, Feſt. 1ſt ſhare.

Lewis Robinſon, Ap. to Grepel, Rathb. Pl. 2d ſh.

Henry Drewitt, taught by his fath. a carver, 3d ſh.

Geo. George, ornam. carver, Lond. Tablets, 1ſh. 1764

John Scott ornam Carver, as below, 2d ſhare.

Rich. Haſlewood, Ap of Moucher, Chaſer, 3d ſh.

Phil. Regnart, then with Mr. Walſh, 4th ſh.

Geo. Reynolds, Apprent. of —— Feſt. 1ſt

[illegible], Apprent. of Holm, Sculp. 2d. ſh.
[illegible], jun. carv. & gild. Mount-ſtr. 3d ſh.
[illegible], Ornament Carver, 4th ſhare.
[illegible], jun. Stuc. Ornam. mak. Tab. 1ſt ſh.
[illegible] Ornam. Carv. H. Holborn, 2d ſhare.
[illegible], with Mr. Ricket, Gloſterſh. 3d ſh.
[illegible], jun. wood carv. Lond. Feſt. ½ Prem.
N. B. The Object being ſufficiently compaſſed, the Premium was diſcontinued.

1775. *Ralph Terry*, preſenting a Tablet with Flowers and Foliage, delicately carved in wood, he was gratified with a Bounty of 3 Guineas.

——— *Modelling Human Figures*, own Compoſitions, Bas-relief, in Clay, age under 22, for 15 Guineas, according to Merit, and under 19 for 10 Guineas.

1758. *Nathan Smith*, a St. Andrew, 18 Inch. high 15G.

1759. *John Bacon*, Fig. of Peace (aged 18 Yrs.) 10 Gs.
Joſ. Nollekens, an early contendant, and now R. A. Abraham entertain. Angels, 15 Guineas.

1760. *Joſ. Nollekens*, again, Jephtha's Raſh Vow, 30 G.
John Bacon, David and Abigail, 15 Guineas.

1761. *Joſ. Nollekens*, the dancing Faun, 10 Guineas.
John Walch, Bacchus of Mich. Ang. 5 Guineas.
John Bacon, Samſon and Dalilah, 15 Guineas.
Nathan Smith, Continence of Scipio, 15 Guin.

1762. *N. Smith* again, Coriolanus & Volumnia, 20 Gs.
Will. Mitchell, the ſame Subject, 10 Guineas.

1764. *John Bacon*, Death of Virginia, 10 Guineas.
John Carter, Slave taking the thorn from a Lion's foot, 15 Guineas.

1764. *J. Bacon*, Since an eminent Artiſt, and Roy. Acad. Mutius Scævola burning his hand, 15 Guin.
John Daintry, the ſame ſubject, 5 Guineas.
Thom. Earley, a Neptune, 5 Guineas.

Prin-

The Principal Figure not under 15 Inches.

John Bacon, Cincinnatus 2d Dictatorſhip, 20 G. 1765.
Thom. Scheemaker, the like Subject, 10 Guineas.
John Carter, the ſame, ſince dead, 5 Guineas.
Charl. Banks, Adonis ſleeping, 15 Guineas.
John Flaxman, aged 11 Y. a Minerva, 10 Gs. 1766.
Charles Banks, an Adonis erect, 10 Guineas. 1767.
Charl. Banks, again, the Death of Lucretia, 20 Gs. 1768.
Charl. Banks, the Death of Julius Cæſar, 20 Gs.
John Flaxman, the ſame ſubject, 10 Guineas. 1769.
John Flaxman, again, Death of Cleopat. S. Med.

CASTS OF FIGURES, 5½ Feet Size, at leaſt.

Thomas Banks, a Prometheus, 20 Guineas. 1769.
John Flaxman, a whole fig. of Garrick, Gold Pal. 1770.
John Bacon, a Mars, ſize of Life, 20 Guineas. 1772.
Jn Bacon, again, a Venus, fem. ſize, 50 Guin. 1774.
J. Bacon, once more, a Narciſſus, 50 Guineas. 1776.
Jn. Ch. Lochée, an Infant repreſ. Statuary, 30 G.
James. S. Gheys, a Lucretia, 15 Guineas.
Laur. Gahegan, Alex. exhort. his Troops, 30 Gs. 1777.
Thom. Engelheart, John Baptiſt in Deſert, 25 G.
John Bacon, a Fig. of Thames, Coloſſal, 50 G.

Hiſtorical BAS-RELIEF IN STATUARY, Original Compoſition, five or more Human Fig. the principal not under 12 Inches, the Age under 25 Years; to obtain or divide 1ſt Prem. 50 Guineas, 2d Prem. 25 Guin.

John Atkins, Regulus return. to Carth. 30 Guin. 1761.
Joſ. Nollekens, Reg. ret. at Carth. miſt. Subj. 2d ſh.
John Eckſtein, Death of Epaminondas, 15 Guin.
Joſ. Nollekens, Timol. before Alex. Marb. 50 G. 1762.
Daniel Eggert, Iphigenia releaſed. Marb. 25 G. 1763.
Thomas Banks, Death of Epaminondas, 30 Gs.
John Eckſtein, the Rape of Caſſand. Marb. 50 G. 1764.
L. And. Holme, Hect. part. with Androm. 25 Gs.

1763. *John Fern. Vander Meulen*, Supplic. of Veturia to Coriolanus, Marble, 50 Guineas.

Thom. Banks, Redemp. of Hect. Body Marb. 25 G.

1766. *J. F. Vander Meulen*, an Allegorical Compoſition, bearing for an Inſcription written with a dart by the hand of Fame, *Britannia reviver of Antique, and prompter to modern Arts*, executed in Marble, framed, and preſented to the Society—For which Thanks were returned him, by Letter.

James Calvert, Death of Socrates, 15 Guineas.
He is now in Jamaica, and has erected the Monument of Sir B. Keith, done by Joſeph Wilton, Eſq; R. A.

1766. *Thomas Scheemaker*, Par & Hel. depart. M. 50 G.
Thom. Banks, Judgm. of Paris, Marb. 10 Guin.

1767. *J. Fern. Vander Meulen*, Abimelech reſtoring Sarah to Abraham, Marble, 30 Guineas.
Theo. Ballant, Sacrif. of Iphigenia, Marb. 25 G.

STATUARY *in Marble*, Human Fig. whole Length, the Size of Life, own Compoſition, and no Age limited.

1762. *Nichol. Read*, Acteon with a Dog, 100 Guineas.
Samuel Harvey, a Ceres, 2d Pr. 50 Guineas.

1763. *Sam. Harvey* again, Bacch. & a Y. Satyr, 70 Gs.

1764. *Nichol. Read*, Diana out of Wat. by a Rock, 140 G.

1765. *Laur. Anderſ. Helm*, Oedipus expounding the Riddle of the Sphinx, 140 Guineas.
Sam. Harvey, a Fig. of Victory, 80 Guineas.

1767. *Laur. Anderſ. Helm*, Sophoniſba with the Cup of Poiſon, 40 Guineas.

ENGRAVING ON GEMS, *after Antique Models*; the Age under 28 Years, for *Cameos* 20 and 10 Guineas: Age 26, *for Intaglias*, 10 and 5 Guineas.

Thom.

Thom. Smith, jun. now profeſſ. S. Engraver, the Meleager, D. Rich. Gall. Onyx, 10 Guineas. 1760.

Nath. Marchant, Pupil of Edw. Burch, Apollo of Belved. D. R. G. Cornel. 10 Guineas. 1761.

Edw. Burch, R. A. Apollo de Villa Medici, D. R. Gall. Onyx, 20 Guineas. 1762.

Nehem. Spicer, the ſame Apollo, Cornel. 10 G.

Nath. Marchant, Head of Homer, Brit. Muſ. Cornel. 10 Guineas.

John Fruin, Gladiat. dying, D.R.G. Corn. 20 G. 1763.

Edw. Burch, R. A. Head of Alexander, from antique Buſt, Onyx, 10 Guineas.

Nehem. Spicer, the ſame ſubject in D. R. Gal. Onyx, 2d Prem.

Nath. Marchant, the Antinous, D. R. G. Onyx, 20 Guineas.

Rob. Staples, the ſame Subject Onyx, 10 Guineas,

Lewis Pingo, the Venus Waſhing her Feet, D. R. G. Corn. 20 Guineas,

Nath. Marchant, Head of the Antinous, D. R. G. Onyx, 10 Guineas. 1764.

Nehem. Spicer, the ſame Subject, Onyx, 2d Prem.

Robert Staples, Head of the Ganymede, D. R. G. Corn. 2d Prem.

Nath. Marchant, the Dancing Faun, D. R. G. Corn. 15 Guineas.

John Fruin, Head of Ganym. D.R.G.Cor. 10 G. 1765.

Robert Staples, Gladiator dying, Corn. 2d Prem.

Edw. Burch, R. A. Head of the Apollo Python, D. R. G. Corn. 20 Guineas

Nath. Marchant, now Profeſſ. Engrav. at Rome, Head of Apol. de Med. D. R. G. Corn. 10 Guins.

Robert Staples, a Head of Laocoon, from the Rhodian Group, Corn Bounty 10 Guineas. 1766.

Nehem. Spicer, Seal Engraver, Ruſſel Court, Cov. Gard, the Farneſ. Hercules, Corn. a Gilt Pallet. 1768.

Samuel

Mock CAMEOS AND INTAGLIAS *in Paſtes*, reſembling Antiques, varied in Compoſition, and perfect in Colour, with Speciſication of the Subjects.

1763. *Samuel More*, ſince Secret. of the Societ. a number upward of 30 diff. Impreſſions, 20 Guineas.

1764. *Sam. More*, again, a more var. ſet, 20 Guineas.

Samples of thoſe productions preſented to the Society in two Frames, are kept among the Gems, in a Glaſs Caſe.

1765. *Edw. Carter*, Jeweller Axe-yard, Weſtm. an Aſſortment of 30 Impreſſions, 10 Guineas.

Richard Fruin, an Aſſort. of 20, 5 Guineas.

1767. *James Taſſie*, Leiceſter-ſq. Figures, Heads, and Portr. of his Compoſ. reſembl. antiq. Onyx, 10 Gs.

CASTING IN BRONZE, the Figure not under 15, and the Group not leſs than 12 Inches, to be repaired after Production: no Age limited.

1763. *Nicholas Anderſon*, Chaſer, dead, *a Flora*, 40 G.

1765. *C. F. Max. Mellian*, Chaſer, dead, a fig. of the *Copper Capt.* and a Companion the *Bobbadil*, 20 Gs.

1767. *John Hazell*, Figure Chaſer, an extended Figure for a *Cruciſix*, 25 Guineas.,

J. S. Manly, Chaſer, the *Group of Laocoon*, 15G.

John Hazell, dead, *Silenus hold. a young Bacchus*, (To perfect as not to want repairing) 20 Guineas.

Albert Pars, the Caſt of an *Anatomy fig.* after Spang (10 Inch. allowed) 10 Guineas.

1761. SUBJECTS *relative to* POLITE ARTS.

WRITING. Tablets to inſtruct Children, *D. Ramier*, 5 Guineas.

1764

1768. CRAYONS, a Meth. of fixing, *Tho. Keyſe*, 30 Gs.

PENMANSHIP, a neat Performance, *Andrew Dickie*, a Gold Pen.

Method

Method of teaching ARITHMETIC to the Blind with an Inſtrument,—*Granville*, 15 Guineas. 1770.

Joſeph Pache, Preparing Crayons, in a manner improved upon Mr. Stoepan's Art; and eſtabliſhing a Manufactory thereof in England; received an aſſiſting Bounty, 20 Guineas. 1772.

John Torin, Ink Invented for Pat. Drawers, 5 Gs. 1773.

Richard Samuel, Artiſt, a Tool invented by him for laying Grounds of Mezzotinto Work, more expeditiouſly than is commonly done, 15 Guin.

MAPS *from Surveys, and* CHARTS *from Obſervations*, in Claim of Premiums annually advertiſed.

SURVEY of the County of Devon, accurately made, by Mr. *Benj. M'Donn*, who obtained 100 G. 1766.

SURVEY of the County of Derby, made by Mr. *P. P. Burdett*, 100 Guineas. 1768.

A MAP of the Iſland of Newfoundland, reduced and neatly drawn, by a Youth, Mr. *Samuel Lewis*, Bounty 10 Guineas. 1772.

A MAP in Survey of the County of Northumberland, made by Lieutenant *Armſtrong*, 50 Guin. 1773.

CHARTS of the Weſt Indies, and a Book for Pilots, preſented by Captain *Joſeph Smith Speere*, a Gold Medal. 1774.

CATALOGUE of the Caſts of Antique and Modern Statues, &c. in the Gallery of H. G. the Duke of Richmond, at Whitehall, not known to have been publiſhed before; and inſerted here on account of the references in the foregoing pages, to the Models from which Students and Candidates had permiſſion to draw in that Gallery, under the inſpection of two eminent Artiſts appointed by His Grace.

N. B. The figures are put down in the order they were found, beginning at the entrance on the left, and thence forward round the room.

1. *Pythagoras*, from an antique Grecian Statue
2. *Antinous ſacrificing*, from a Roman antique Statue in the Capitol at Rome.
3. *Diſcobolus*, a Greek Statue, original, in the poſſeſſion of Will. Locke, Eſq. Portman-ſq.
4. *Venus de Medici*, fineſt Grecian Sculpture, in the Florent. Gallery.
5. The *Fighting Gladiator*, fine Greek Sculpture, at the Villa Borgheſe, at Rome.
6. The *Dying Gladiator*, a renowned Greek Statue, in the Capitol at Rome.
7. *Santta Suſanna*, by Franc. du Queſnoy, *detto il Fiamingo*: a fine modern Statue, in the Church of the Virgin of Loretto at Rome.
8. *Apollo Python*, a Greek Statue of the Belvedere, in the Vatican Palace at Rome.
9. *Paetus and Arria*, a Group in the Grecian Style, Ludoviſi Villa at Rome.
10. *Meleager with the Caledonian Boar's Head and the Dog*, original, Greek ſtyle, in the Capitol at Rome.
11. *A Dancing Faun*, fineſt Greek Sculpture, in the Florentine Gallery.

12. *Bacchus*

12. *Bacchus and Faunus*, modern Group by *Sanſovino*, Florentine Gallery.
13. *Mercury*, Greek Statue, the original in poſſeſſion of Lord Bateman.
14. *The Wreſtlers*, antique Group, Greek Sculpt. Tribune Florent. Gallery.
15. *Ganymede*, antique *Torſo*, reſtored by *Sanſovino*, Florent. Gallery.
16. *Venus waſhing her Feet, or Spinam educens*, Greek Sculpt. reſtored by Sanſovino, Florent. Gall.
17. *Bacchus and Faunus*, famous Group, by Mich. Angelo, Florentine Gallery.
18. *Apollo de Medici*, or *Little Apollo*, fine Greek Statue, hands reſtored by Legros, Florentine Gallery.
19. *Cupid and Pſyche*, ſmall Group, Florent. Gall.
20. *Flora*, antique, fine drapery, Capitol, Rome.
21. *Faun with a Goat*, Odeſcalchi Palace at Rome.
22. *Venus Callipædia, ſuppoſed coming from the Bath*, in the Farneſian Palace.
23. *Camillo*, or *Miniſtro Sacrificolo*, antiq. Bronze, in the Capitol.
24. *The Idol*, a tutelar Deity, *unus e Diis præſtitibus*, antique Bronze, Florent. Gall.

Buſts upon Brackets, about the Room.

1. Head of *Ariadne*, original in Capitol, Antique.
2. Head of *the Father* in the Group of the Rape of the Sabines, by *Giovan. Bologna*, in the Piazza of the Old Palace at Florence.
3. Head of *the Daughter*, in the ſame Group.
4. Head of *the Soldier*, in the ſame Group.
5. Head of *Caracalla*, original in the Capitol.
6. Head of *Demoſthenes*, original Greek. Farneſin.
7. Head of *Alexander*, original, in the Capitol.
8. Head of *Juno*, fine Greek origin. in Capitol.
9. Head of the *Farneſian* Hercules.
10. Head of *Adrian*, Greek ſtyle, Florent. Gall.

On

On the Mantle of the Chimney.

A Buſt of *Marcus Aurelius*, in the Villa Ludoviſi.
A Head of *Seneca*, from the Florentine Gallery.
Hercules and Anthæus, by G. Bologna, Terra Cotta.
Bacchanalian Triumph, caſt from a Bronze Bas Relief of Laurenzo Guiberti, on a Pannel of the Altar ſerving as a Pedeſtal to the Statue, Fig. 24. at the Florent Gall. Another Pannel has the following *Nuptials*, or *Nova Nupta*, Antique Bas-relief.
The *Rape of the Sabines*, a fine Bas or rather Alt-relief in Bronze, by *Giovan Bologna*.

On the Tables and Walls behind the Doors.

1. Coloſſal Feet of the *David*, by Michael Angelo, Old Palace at Florence.
2. Hands of *St. Ignatius*, by Legros, from a Silver Coloſſal Statue in the Jeſuit's Church at Rome.
3. Hands of the Statue of *Charity and Fortitude*, on the Monument of Pope Urban VIII. by *Bernini*, in St. Peter's Church at Rome.
4. A Number of Caſts from the *Trajan Column* at Rome.

This valuable Collection, particularly eſteemed for the judicious choice of the Originals, was made for His Grace, by *Joſeph Wilton*, Eſq. R. A. and Sculptor to the King, during the purſuit of his Studies in Italy, from 1750 to 1756. The ſame able Artiſt likewiſe executed for his Grace, in 1758, a beautiful Statue in Marble of the Apollo of Belvedere, the exact ſize of the well known maſterly Original. It is placed in a receſs by the door of the Gallery, facing the Terrace of the Garden, next to the River.

ART.

ARTICLE XVI.

Liſt of Premiums and Bounties, beſtowed on various Objects in Agriculture, Mechanics, Manufactures, Chemiſtry, and Trade; from 1767 *to* 1776. *Continued from Vol.* I. *none being publiſhed in Vol.* II.

AGRICULTURE.

1767. GRASS SEEDS; ſowing the following;

Meadow Feſcue, 2 Acr. Sheep's Feſcue, 1 Acr.
Common Poa, 1 Acr. Annual Poa, 1 Acr.
Yellow Oat, 1 Acr. Meadow Foxtail, 1 Acr.
Creſted Dog's Tail, 1 Acr. Seven ſorts at £. 20
Thomas Stacey, Morton, Surry, £. 140

Lucern, an Account of its Culture, Chriſtopher Baldwin, Eſq. Clapham Com. Surry, a G. Medal.

MADDER, planting Quantities, at £. 5 per Ac.

Joſeph Flight, Compton Surry,	18 Acr.	lb.	90
Thom. Giles, Breadburn, Kent,	4 —	—	20
Jerem. Giles, St. Mary, Canterb.	7 —	—	35
Thom. Parſons, Taunt. Somerſet.	2 —	—	10
John Reynolds, Adiſham, Kent,	4 —	—	20
John Crow, Feverſham, Kent,	2 —	—	10
John Sutor, Barnes, Surry,	1 —	—	5
Wil. White, Iſle, near Exeter,	2 —	—	10
John Lane, Teynham, Kent,	1½ —	—	5
Charles Roſe, Deviſes, Wilts,	2 —	—	10
Thomas Bevor, Hethal, Norfolk,	2 —	—	10
J. Neame, Berſkingham, I. Thanet,	1 —	—	5

WAX *collected without deſtroying Bees:*

P. Daley, Woodbury, Dev.	11 lb. wt.	6	Hives.
Joſ. Pople, St. Law. Ludl.	12 ——	7	——
T. Young, Walt. Croſs, H.	21 ——	13	——
Nath. Thorley, Iſlington,	13 ——	9	——
And. Turner, Elvetham,	12 ——	10	——
F. Bernard, Stroudw. Glo.	11 ——	8	——

At £. 5—for each attempt £. 30.

Wheat,

WHEAT, account of a profitable Cultivation, Mat. Cox, Eſq. Walhampton, Hants, a G. Med.

1768. MADDER, J. Harriſon, Preſt. Kent, 13 Acr. £. 65

John Dudlow, St. Mary Bredm. Cant. 3 Acr. £ 15

WHEAT, Account of a profitable Culture, Sir Digby Legard, Ganton, Yorkſh. a Gold Medal.

1769. SCOTCH FIRS for Timber, ſetting 61,800 plants, Wil. Beckford, Eſq. Fonthill, Wilts, a G. Medal.

And Matth. Barnes, Norfolk, for 52,000 Plants, ſecond Prem. Silver Medal.

BURNET, introducing the Culture into Huſbandry, Rob. Barber, Gover, Exon. a G. Med.

HOGS *reared and fattened by a particular Method*; Arthur Young, Eſq. North Mims, Herts, a G. M.

COLE SEED, account of the Culture, the ſame Gent. a Gold Medal.

TURNEP-*rooted* CABBAGE introduced into Huſbandry (with other valuable Communications) John Reynolds, Adiſham, Kent, 50 Pounds.

TURNEPS *cultivated with Beans*; an Account of the Method; Mr. Phil. Chambers, a Silv. Medal.

Improvements in Agriculture, imparted to the Society, *John Wynne Baker*, Eſq. Dublin, a G. Med.

True RHUBARB *Seed*, introduced into England, Dr. James Mounſey, F. R. S. a Gold Medal.

RHUBARB *cultivated in England* from the ſame Seed, James Ingliſh, Hampſtead, a Gold Medal.

1771. *Spaniſh* CHESNUTS, 9000 planted by Edward Jacob, Eſq. Nackington, Kent, a Gold Medal.

BURNET *ſown*, ſeven Acres, John Reynolds, Adiſham, Kent, 10 Pounds.

WHEAT *ſown in Spring*, Account of Succeſs on 97 Acres, J. Staward of Roſs, Durham, 50 Pounds.

MADDER, Culture and Cure of 32 h. 1 qr. 24 lb. clean Roots obtained from 1 Acre, 8 Perches, by John Crow, Feverſham, (ſee p. 178.) a G. Med.

TIMOTHY

TIMOTHY GRASS, BURNET, and *Turnep-rooted* CABBAGE, Obſervations on their Culture, by the Rev. Davies Lamb, M. A. at Ridley, in Kent, (ſee vol. ii. p. 333.) a Silver Medal.

Turnep-rooted CABBAGE; Account of Culture and Obſervations on the Plant, Henry Jeſſard of Minſter, Iſle of Thanet, (v. ii. p. 344) a Silv. Med.

POULTRY *hatched, reared,* and *fattened,* by particular methods; Edward Turner, Up. Moorfields, 6 Guineas.

Setting and Sowing ACORNS, comparatively, 49 Acres, John Leech, Eſq. Witley, Surry, G. Med. 1772.

ALDER, 11 Acres planted 1769, John Ramey, Eſq. Gr. Ormſby, Norfolk, 30 Pounds.

MADDER, 1 Acre planted, James Potter, Eſq. Mitcham, Surry, 3 Pounds.

Turnep-rooted CABBAGE, 5 Acr. 3 Rd. 33 Perches planted, Henry Jeſſard, Iſle of Thanet, (ſee p. 139) 5 Pounds.

BLACK CATTLE, *reared without Milk,* by part. Method, Mr. Will. Budd, Wandborough, Surry, (ſee p. 149) a Gold Medal.

RED SPIDER *and* BLACK FLY, deſtroyed by a fumigating Machine in Gardens and Hot-houſes, Mr. Thomas Green, Royal Gardener, at Kew, (ſee p. 349.) 20 Pounds.

PARSNEPS *in Field Culture* for feeding Cattle, practiſed by Mr. Will. Budd, in Surry, (ſee p. 104.) a Silver Medal.

SPRING WHEAT *cultivated,* and diſtributed in neighbouring Counties, by Mr. Daniel Eaton, Dean, Northampt. (ſee p. 45.) a Silver Medal.

SIBERIAN BARLEY, introduced, cultivated, and ſpread into various parts of the Kingdom, by Th. Widdens, Eſq. (ſee p. 9.) Liverpool, a Silv. Med.

The ſame BARLEY, experimentally treated, and

diſtributed in England, Scotland, and Ireland, by William Halliday, Eſq. of Anfield, Lancaſhire, (ſee p. 3.) a Silver Medal.

CLUSTERED POTATOE, the Culture of this Kind rendered generally uſeful, John Howard, Eſq. Carlington, Bedfordſh. (ſee p. 305) a G. Medal.

MADDER, dry clean Roots, 33 h. 1 qr. 20lb. wt. from 1 Acre 2 Perches, Mr. John Crow, of Feverſham, (ſee p. 181) 15 Pounds.

MADDER, Account of Culture and Cure of 51 h. 1 qr. 26 lb. clean, dry Roots, from 1 Acre, 1 Perch, Mr. John Crow, Feverſham, (ſee p. 183.) 23 Guineas.

The like Account of 27 h. 3 qr. 18 lb. wt. clean, dry Madder Roots, from 1 Acre, 4 Perch. Mr. Geo. Walker, Feverſham, (ſee p. 186.) 5 Guineas.

1773. SCOTCH FIR, ſetting 72,000 Plants, J. Sneyd, Eſq. Beſhton-hall, Staffordſhire, a Gold Medal.

SCOTCH FIR, planting out 24,000, J. Harriſon, Eſq. Thorphall, Lincolnſhire, a Silver Medal.

WHEAT *ſown in Spring*, 97 acres, 1769, and 150 Acres, 1771, cultivated, Mr. John Steward, Roſs in Durham, (ſee p. 72 and 82.) each claim, 50 Pounds.

TURNEPS *among* BEANS, ſown upon 54 Acres, with an Account of the Soil, Culture, Produce, &c. Mr. Wil. Tadman of Higham, in Kent, (ſee p. 96.) a Gold Medal.

FEEDING SHEEP *and* CATTLE *profitably*, from the Culture of proper Plants and Herbs, of which a particular Account is given, Mr. John Reynolds, of Adiſham, Kent, (ſee p. 112.) 10 Guins.

1774. ELM, planting 8000 for Timber, J. Williamſon, Eſq. Milton, Yorkſhire, the Gold Medal.

MADDER, the greateſt quantity raiſed from an Acre, 27 h. 3 qr. 5 lb. wt. clean, dry Roots, Mr. John Crow, Feverſham, (ſee p. 189.) 10 Pounds.

MAD-

MADDER *manufactured*, obtained from one Ac. one Perch, 18 h. 2 qr. 18 lb. wt. dried and prepared for uſe, the ſame Mr. John Crow, (ſee p. 191.) 10 Pounds. 1775.

TURNEPS *ſown among* BEANS, cultivating 74 Acres, and giving an Account of the Method, Mr. William Tadman, of Higham, Kent, (ſee p. 101.) a Gold Medal.

RHUBARB, cultivating the true Kind, and producing a Quantity of the cured Root, in a Marketable ſtate, Sir Alexander Dick, Preſtonfield, near Edinburgh, (ſee p. 208.) the Gold Medal.

RHUBARB, of ſimilar Culture, the ſame Quantity, but leſs marketable, Mr. Michael Callendar, Newcaſtle upon Tyne, (ſee p. 226.) a Silv. Med.

ACORNS, *planted for raiſing Timber*, 23 Acres, at Shellinglea Park, Rt. Hon. Earl Winterton, the Gold Medal. 1776.

ASH *to grow for Timber*, 20 Acres planted by Wm. Woolaſton, Eſq. at G. Finborough, Suffolk, the Gold Medal.

LOMBARDY, *or* PO POPLAR, 2613 Sets planted to raiſe Timber, in Shellinglea Park, Rt. Hon. Earl of Winterton, the Gold Medal.

The ſame POPLAR, 11000 Plants ſet for the like Purpoſe, Rich. Muilman Trench Chiſwell, Eſſex, the Gold Medal.

SUN FLOWER SEED, producing 15 Buſhels of Seed, of the large annual Flower, for an Experiment on the Utility of extracting Oil therefrom, Rev. Henry Bryant, 20 Pounds.

INSTRUMENTS AND MACHINES, *or* Models, relative to AGRICULTURE.

N. B. [S. R. indicate the Machine or Model being in the Society's Repoſitory.]

1767. A PLOUGH of new Conſtruction *for draining Land*, invented by Wil. Knowles, Iſle of Wight, S. R. 50 Guineas.

1768. A PLOUGH *for Trenching*, and another for cutting three Furrows at once, both invented by W. Ducket, Claremont, Surry, S. R. 50 Pounds.

[See Vol. I. Page 14 by Anticipation.]

1769. A MILL *for Threſhing and Winnowing Corn*, invented by John Evers, of Swillington, Yorkſhire, S. R. 50 Guineas.

A STRAW *or* CHAFF-CUTTER, invented by J. Edgell, Eſq. of Frome, Somerſetſh. S. R. 20 Gs.

1770. A DRILL PLOUGH of new Conſtruction for ſowing Wheat, Nathan. Beſtland, Woodyeats, Dorſetſh. Model S. R. 10 Guineas.

A MILL *for* BOLTING and dreſſing Flour, in ſucceſſive Operations, Nathan. Stedman, near Seven Oaks, Kent, S. R. 10 Guineas.

STRAW CUTTER, of an improved Conſtruction, by Mr. William Bailey, S. R. 20 Guineas.

1771. DRILL PLOUGH, improved, by Wil. Craik, Eſq. at ——, Scotland, S. R. a Gold Medal.

DRILL PLOUGH, delivering Manure with Seed, Rev. Dr. Benj. Gale, at Killingworth, N. England, S. R. a Gold Medal.

PLOUGH *cutting hollow Drains*, invented by Mr. Makins, Clare, Suffolk, S. R. 50 Guineas.

HORSE-HOE, of new conſtruction, Rev. Mr. Hewett, Somerſetſhire, S. R. a Gold Medal.

BOLTING-MILL, improved, by Mr. Preſton, Crooked-lane, Cannon-ſtreet, 10 Guineas.

BRUISING MILL, for Oats, Malt, and other Grain, Mr. Elias Wilcox, Tamworth, S. R. 12 P.

CONSTRUCTION *of* PLOUGHS, an Account of the Principle of their beſt Conſtruction, Mr. Cuthbert Clark, S. R. (ſee p. 232.) the Gold Medal.

IN-

INSTRUMENTS *and Models of* MACHINES *for* HUSBANDRY, ſeverally produced, Mr. Gregſon, Roſehill, Suſſex, 10 Guineas. 1773.

LEVELLING LAND, a Machine of a new Conſtruction, Mr. Chriſtopher Saverland, at Lord Hyde's, Model S. R. a Gold Medal.

SLICING ROOTS, to feed Cattle, a ſimple Machine, Nicholas Turner, Eſq. of Bignor Park, S. R. a Silver Medal.

PLOUGH *with a circular Coulter*, for Stubble and rough Ground, Matthew Peters, Eſq. Newport, Iſle of Wight, S. R. (ſee p. 266.) a Silver Medal. 1773.

DRILL PLOUGH, a new Conſtruction, for Horſe Beans, Mr. Thomas Hope, of Eccles, Mancheſter, S. R. 20 Pounds.

PLOUGH *with hollow mould Board, but made wholly of Iron*, Mr. Brand, of Manningtree, in Eſſex, S. R. 20 Guineas.

DRILL PLOUGH, *for Corn and Seed of various Kinds*, invented by Mr. James Blancher, Attleborough, Norfolk, S. R. (ſee p. 340.) 30 Pounds. 1774.

STRAW CUTTER, much improved, Mr. Stephen Smith, Heathfield, Suſſex, S. R. 20 Guineas, and the Gold Medal.

PLOUGH *to mend* ROADS, *to fill up the Ruts, and level the Quarters*, Mr. Chriſt. Pinchbeck, Cockſpur-ſtreet, Hay-market, S. R. the Gold Medal.

Inventions and Improvements in MECHANICS.

N. B. [S. R. denote the Piece to be ſeen in the Society's Repoſitory.]

HINGES *with ſpiral Springs*, for ſhutting Doors, *Peter Delevitz*, St. Andrew-ſtr. Seven Dials, S. R. 15 Guineas. 1768.

CARTS, a new Machine Cart for Collieries, Mr. *Black*, of Berwick, S. R. 10 Guineas.

SAW MILL, erecting one complete at Limehouſe, and ſeconding the Views of the Society. *Charles Dingley*, Eſq. of Hampſtead, S R. G. M.

PUMPS, Model of a Machine for raiſing Water with a ſpiral Tube, invented by Mr. *Wirtz*, uſed in Switzerland, and communicated by Mr. *J. H. Ziegler*, of Winterbour, in Zurich, S. R. G. Med.

1769. TIRE *for* WHEELS, Model of a Machine for making the Tire, Mr. *Thomas Hunt*, of South Lambeth, S. R. 10 Guineas.

GAUGING, an expanding improved Gauging-rod, Mr. *J. Efford*, then Weſtminſter, now Cornwall, S. R. 17 Guineas.

INVENTIONS, various, communicated to the Society by *Richard Lovel Edgworth*, Eſq. Berkſhire, a Gold Medal.

SPRINGS *for Carriages*, a new Improvement by Mr. *Joſeph Jacobs*, St. Mary Axe, S. R. 20 Guin.

HYDRAULICS, a new invented Machine for raiſing Water out of Mines, Mr. *Wil. Weſtgarth*, near Newcaſtle, S. R. 50 Guineas.

1770. PUMPS, a new invented Piſton and Box, not liable to choak up by Sand or Gravel, Mr. *John Blandford*, a Mariner, 15 Guineas.

PORTABLE OVEN, made of Iron, to fit a German Stove, Mr. *Robert Clements*, Green Dock, Wapping, S. R. 15 Guineas.

JACKS *for raiſing Weights*, a ſafe Conſtruction, uſeful in Warehouſes, Wharfs, Docks, &c. *Abrah. Staghold*, Maldon, S. R. 20 Guineas.

PULLIES *for Saſhes, improved*, *Henry Flowers*, Long Alley, Moorfields, S. R. 3 Guineas.

AUGER, a new conſtructed Worm-Auger, Mr. *Phineas Cook*, Sheffield, S. R. 30 Guineas.

WIMBLE, a Breaſt Wimble moving in all directions with Dr. Hook's univerſal joint, *Peter Delevitz*, S. R. 10 Guineas.

BAL-

BALANCE *for Weighing*, an Index Scale for every uſe according to ſize; Mr. *Sebaſtian Clayſs*, of the Palatinate, S. R. the Silver Medal.

HARPOON, contrivance of a Gun Harpoon to ſtrike Whales at a diſtance, Mr. *Abraham Staghold*, Maldon, Eſſex, S. R 20 Guineas.

WHEEL CARRIAGE, Model of a Waggon turning in the leaſt Angle, Mr. *William Bailey*, Jun. S. R. 20 Guineas. 1772.

FLAT ARCH, Model of one, in which the lateral preſſure is much diminiſhed, Mr. *Jaſ. Arrow*, Rocheſter-row, Wmſtr. (ſee p. 270) S. R. G. M.

ALARM, an Apparatus to warn in caſe of Fire, or the breaking in of Thieves, Meſſ. *John Inolls* and *William Jewers*, Harwich, S. R. 20 Guineas.

WHEEL CARRIAGES, Method of aſcertaining the comparative excellence of ſuch Carriages, Mr. *Cuthbert Clarke*, with Lord Liſburn, Devon. (ſee p. 250) 15 Guineas. 1773.

HARPOON, improvement on his Gun Harpoon to ſtrike Whales at a diſtance, Mr. *Abr. Staghold*, Maldon, 30 Guineas.

SAW MILL, for an improvement therein, to cut compaſs-work, Mr. *Ja Stansfield*, of Yorkſhire, ſince of Limehouſe Bridge, S. R. 30 Guineas.

TIME-KEEPER, a ſimplified Time-piece, or Clock, invented by Mr. *Matth. Hill*, Scarborough, S. R. 50 Guineas.

HINGES *for Doors*, newly conſtructed, to riſe and fall eaſily, Mr. *Edw. Gaſcoigne*, St. Martin's Lane, S. R. the Silver Medal.

RAISING WATER to the upper part of houſes by an eaſy Method, Mr. *Sam. Phillips*, Goodge-ſtr. Totenh. Ct. Rd. a Drawing, S. R. a Silv. Medal. 1774.

CUTTING CHIP to make Hats, an improved Tool, contrived by *Rob. Galloway*, of Hertfordſh. S. R. 25 Guineas. 1775.

RAISING ORE, Model of a Machine to raiſe it in Quantity, Mr. *John Hulman*, Redruth, Cornw. S. R. 5 Guineas.

CABSTAN, Model of one much improved, Mr. *John Deſcher*, of Wapping, S. R. 5 Guineas.

GUN HARPOON, improvement on the Swivel Gun and Harpoon, preſented with much public Spirit to the Society, by Mr. *Rich. Gibſon*, of Whitby, S. R. 30 Guineas.

1775. GUN HARPOON, account of the manner of, and ſucceſs in uſing them, Capt. *Humph. Ford*, 20 Gs.

GUN HARPOON, encouragement for promoting its uſe in the Whale Fiſhing veſſels, to the following Captains, *Cheſment*, *Thew*, *Brinkley*, and *Franck*, each a Silver Medal.

GUN HARPOON, its uſe encouraged; ſtriking a Fiſh at more than ſix fathom diſtance, *Joſ. Coulſon*, Harpooneer, one Guinea.

Expended for ſeveral *Guns and Harpoons* given to Maſters of Veſſels in the Whale Fiſhery, and in trials made on Shore, to aſcertain particular Circumſtances, 113 l. 10 s. 6 d.

1776. CARRIAGES, conſtruction of a Waggon turning in a ſmall Angle, Mr. *J. Hudſon*, L. Acre, 10 Gs.

FISHING UP GOODS *from the bottom of the Sea*, Model of a Machine to do the ſame with eaſe and ſafety, Mr. *John Fraſer*, Newcaſtle, S. R. 10 Gs.

FLOATING LIGHTS, to preſerve the lives of men who fall overboard, invented by Mr. *Wm. Shipley*, Maidſtone, Kent, S. R. the Silver Medal.

COACH-BRACE, Contrivance of one more elaſtic and durable than the common, Mr. *Groſs*, Hoxton, S. R. 10 Guineas.

DIVING BELL, improved upon that generally known, *Cha. Spalding*, a Drawing, S. R. 20 Guin.

Pre-

Premiums and Rewards for Matters relative to MANUFACTURES *and* TRADES.

PAPER, Method of making it from various Vegetables, Mr. *Jac. Chriſt. Scheffer*, Regenſberg, Germany, a Silver Medal. 1768.

ARTIFICIAL FLOWERS, made neatly, Miſs *Fleury de Remont*, St. John's-ſtr. May Fair, 3 Guineas.

ARTIFICIAL FLOWERS, made of Straw, Mrs. *Mary Bradock*, Haverford Weſt, 5 Guineas.

TRAMEL NETS, contrivance to make them eaſily, *Thomas Everett*, Clare-market, 20 Guineas.

ARTIFICIAL FRUIT, arranged in a Baſket of her own making, Miſs *Mary Eliz. Jones*, Bnty. S. Pal. 1770.

WEAVING LOOM, improved for a variety of work, Mr. *J. Almond*, Gr. Eſton, Leiſterſh. 50 G. 1771.

DOUBLING *and* TWISTING YARN, a Machine to do that Work expeditiouſly, Mr. *J. Ling*, Loughborough, 7 Guineas.

BLEACHING Tow and Flax, by an improved method, Mr. *Joſ. Bragge*, Illminſt. Somerſetſh. 10Pds. 1772.

NEEDLE WORK, imitating Tapeſtry, drawn and worked by Miſs *Mary Hoare*, Piccadilly, 5 Guins.

WEAVING TAPESTRY *and other figured Work*, made in the Loom, by particular improvements in that Machine, Meſſ. *Geo. and N. Freeſtone*, Kidderminſter, 25 Guineas. 1773.

DYING LEATHER RED, improving the diſcloſed method of preparing and colouring the Turkey Leather, Mr. *William Blake*, Alderſgate-ſtreet, Silver Medal.

And to his Partners (being no members of the Society) Meſſ. *Hammerſmith* and *Brix*, Chiſwick, each 4 Guineas.

BLEACHING FLAX *and* Tow, farther proofs of the efficacy of his method of proceeding, Mr. *Bragge*, Illminſter 10 Pounds. 1774.

CHIP

CHIP HATS, eſtabliſhing a Manufacture from Willows of his own cultivation, Mr. *John Pepperell*, Totneſs, Devon, ſee p. 358. 30 Guineas.

TURKEY LEATHER *imitated*, and ſurpaſſed in a comparative Trial with ſome of the beſt red imported, Mr. *Will. Blake*, of Alderſgate-ſtr. (a member of the Society) the Gold Medal.

And to his Partners (no Members) at Chiſwick, 20 Pounds.

BLACK SILK LACE, the art of making that Lace taught to 133 Girls, by Mr. *John De la Motte*, Bridgenorth, Shropſhire, the Silver Medal.

WIRES *for* CARDS, the Invention, Improvement, and Introduction of his Machine for expeditiouſly cutting, doubling, and crooking the Wires for Cards to comb Wool and Cotton, Mr. *William Ray*, Tooley-ſtreet, Southwark, 50 Guin.

1775. FISHING NETS, woven of conſiderable breadths in a Loom, invented by Meſſ. *Freeſtone*, Kidderminſter, 20 Guineas.

MILLED CAPS, a variety made in imitation of the French, Mr. *Rowlandſon*, Richmond, Yorkſh. 15 Pounds.

BLACK DYE, the knowledge of the true Black Dye experimentally proved to be poſſeſſed in England, in oppoſition to a pretended Foreign Claim, Mr. *Tho. Vincent*, Southwark, the Silver Medal.

DYING SHEEP SKINS *of various Colours*, by an improved method of preparing, dreſſing, and colouring Leather, uſed for Gloves, Shoes, and Slippers, Mr. *David Souter*, Clerkenwell, 25 Guineas.

1776. WINDOW BLINDS of a ſort of Chip, made quick and cheap by Weaving, Mr. *John Sullivan*, of Barbican, 5 Guineas.

UMBRELLA, one of a new Conſtruction for open Carriages, *Collin Mackenzie*, St. Martin's-ſtr. Leiceſter Fields, 5 Guineas.

SUBJECTS belonging to the CLASS of CHEMISTRY.

SAL AMMONIAC; encouragement given to eſtabliſh a manufacture in England; Mr. *Faulconbridge*, Bewdley, 20 Guineas. 1769.

GLASS FOR TELESCOPES, attempt to produce Glaſs fitter than that hitherto made for the Uſe of Opticians; Mr. *Abrah. Pelling*, Lambeth, 30 Pounds. 1770.

GLASS FOR TELESCOPES, attempt to correct the defects in the Glaſs commonly made, and to render it fit for Achromatic Purpoſes; Mr. *Rich. Ruſſel*, Well-ſtreet, 40 Pounds. 1771.

WHITE COPPER made with Engliſh Materials, in imitation of that brought from the Eaſt Indies, Dr. *Brian Higgins*, Greek-ſtreet, Soho, the Gold Medal. 1773.

CRUCIBLES, a Manufacture of Black Lead, or blue melting Pots, eſtabliſhed at Chelſea; Meſſ. *Ruhl* and *Hempel*, 30 Pounds.

CLEANING IVORY, a method of taking out Spots, and the yellow Hue of old Ivory, and an attempt to reſtore its original Colour, Mrs. *Johanna Krulle*, (ſee page 376) 10 Guineas.

BRONZE, a Manufacture of Metal Leaf and Bronze Powder ſet up in London; Mr. *Emanuel Salomons*, Houndſditch, 15 Guineas.

NOXIOUS EFFLUVIA rendered inoffenſive, or a method of preventing the ill effects of the Vapour of Mercury ariſing in Water Gilding Metals; Mr. *John Hills*, Brewer-ſtr. Oxford-ſtr. (ſee p. 370) 20 Guineas. 1774.

BLACK LEAD, Importation of 28 Ton and 1800 lb. weight of that Mineral for making Crucibles; Meſſ. *Ruhl*, *Hempel* and Co. Chelſea, 30 Pounds. 1775.

IRON, refining Britiſh Iron Ore, and making

it white and tough, for Wire and ſmall Work, Mr. *John Bedford*, Bridge End, Glamorganſhire, (ſee p. 366) 20 Guineas.

Matters reſpecting TRADE WITH THE COLONIES, the WEST INDIES, &c.

1768. VINES planted for making Wine, *Edward Antill*, Eſq. near Brunſwick, N. America, 200 Pounds.

1769. —— planting 2100 Sets for Wine, the *Earl of Sterling*, New Jerſey, N. America, a Gold Medal.

1771. —— planting and cultivating a number in S. Carolina, and producing Wine made of them, Mr. *Chriſtopher Sherb*, Carolina, 50 Pounds.

1772. —— planting and cultivating Vines, and Indigo, and producing Silk by foreign Proteſtant Labourers in the interior part of S. Carolina; Mr. *du Menil de St. Pierre*, of Charleſtown, the Gold Medal.

1773. ZEBRA WOOD, imported into England, 14,303 feet from the Moſquito ſhore; the Hon. *Daniel Hewlet*, Eſq. of Black River, the Gold Medal.

BOTANIC GARDEN, for ſuperintending the cultivation of one in the Iſland of St. Vincent, relating the event of ſome trials, and propoſing farther attempts; Mr. *George Young*, Surgeon in that Iſland *, (ſee page 196) the Gold Medal.

1774. INDIGO, made in Eaſt Florida, deemed equal to the Spaniſh, and produced with Certificates, and an Account of the Culture, from the Eſtate

* An extenſive piece of ground, as various to aſpects and ſoils, in the gift of the governor, was granted for the above purpoſe by General *Melvill*; who farther entered into conſiderable expence for clearing, encloſing, and cultivating the ſame as a garden, from a public ſpirited diſpoſition to promote the views ſet forth in the Advertiſements of the Society.

of *Henry Strachey*, Eſq. (ſee page 205) the Gold Medal. 1775.

SILK IN MINORCA, obtained from Worms raiſed in that Iſland, 22 lb. weight, produced by an Inhabitant, Mr. *Joſeph Soler*, 2 l. 15 s.

ZEBRA WOOD, imported in 1774, a quantity of 9488 feet from the Moſquito Shore, *John Pitt*, Eſq. the Gold Medal.

EARTH NUTS, AND SESAMUM SEED for Oil, imported and preſented to the Society, a large quantity of each, with information relative to the utility of extracting Oil from them; Mr. *Samuel Bowen*, of Georgia, the Gold Medal. 1776.

ZEBRA WOOD, imported in 1775, from the Moſquito Shore, 25,857 feet, *George Hewm*, Eſq. the Gold Medal.

SUMMARY ACCOUNT OF REWARDS given in the Several Claſſes of Subjects, and the Reſpective Committees, from the Beginning of the Inſtitution of the Society, to the Year 1776, incluſive.

(Comprehending what was mentioned Vol. I. p. 27.)

	£.	s.	d.	Medals. Gold	Silv.	Pallets. Gold.	Silver Gr.	Sm.
Agriculture	3201	19	0	56	26			
Polite Arts	8325	5	0	10	6	17	47	37
Manufactures	2026	1	0	1	3			
Mechanics	2284	14	6	6	10			
Chemiſtry	1315	5	0	2	1			
Trade and Colonies	2785	13	8	12	—			
Fiſh by Land Carriage	3500	0	0					
Particular Services	113	0	0	16	—			
£.	23551	18	2	103	46	17	47	37
103 Gold Medals coſt	756	2	0					
46 Silver Medals	44	5	6					
17 Gold Pallets	159	16	0					
47 Great Silv. Pallets	63	9	0					
37 Small Silv. Pallets	40	14	0					
£.	24616	4	8					

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